Development of Disaster Resilient Coastal Communities to Enhance Economic Development and Social Welfare

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to Enhance Economic Development and Social Welfare
Book of Abstracts

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With the support of:

DEVELOPMENT OF DISASTER RESILIENT COASTAL COMMUNITIES TO ENHANCE ECONOMIC DEVELOPMENT AND SOCIAL WELFARE

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Contents

Foreword

Coast at risk – the importance of risk knowledge

Coastal communities all over the world are under severe pressure resulting from planned and unplanned development, population growth and human induced vulnerability, coastal hazards with increasing frequency and magnitude and impacts of global climate change. These unprecedented changes have increased the level of risk of such coastal communities from a wide range of coastal hazards arising from natural phenomena and human induced activities. In this respect the assessment and management of risk for coastal hazards plays a vital role for safety of human lives, conservation of ecosystems and protection of the built environment. It leads to the development of disaster resilient communities to enhance economic development and social welfare.

Risk assessment is one of the fundamental first steps towards planning, improving and implementing effective disaster risk reduction policies and programmes. One has to know and identify risks if they are to be effectively reduced and contained. There is a need to develop simplified approaches to risk assessment to convince a wider stakeholder base that investing in risk assessments pay. Such approaches bring together so many members of civil society leading the efforts to make disaster risk reduction everyone's business.

The process of risk assessment and management is based on understanding hazards, vulnerability, preparedness, the superposition of which leads to its assessment. Once the risk is assessed, it could be managed by reducing or mitigating hazards, mitigating vulnerability, improving preparedness risk transfer via insurance where possible. One of the important risk management measures is the presence of early warning and public warning systems. Responding positively to such systems play a vital role in saving lives. Therefore risk knowledge which represents the awareness of the community of potential hazards, vulnerability and the proneness of the community to the impact of the hazards is a critical component of coastal community resilience

Hazards are potentially damaging physical events, phenomena or human activities that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. They represent the possibility of occurrence of a natural/human induced event of a probable magnitude or intensity that includes a specific area of exposure. Within this geographical area, human life, ecosystems and infrastructure can be potentially affected by the hazard. Hazards can be classified according to the source of origin, natural/human induced and the manner in which it manifest itself, episodic/chronic. Their impacts are assessed with respect to magnitude, space and time. Tools and methods available to study the hazard include, field investigations, image analysis and mathematical modelling. Recently both deterministic and probabilistic modeling have been used extensively to study scenarios, both which have taken place and may take place in the future.

Vulnerability represents the proneness of society and its full structure to be affected by the hazard and capacities focus on group measures that are in place to help the community to cope with the event and preparedness represents the presence of measures and tasks which could reduce the loss of human lives and property slightly before or during disaster. In this respect communities must be made aware of the hazards, their exposure, vulnerabilities and the importance of capacity building and preparedness leading to hazard resilient communities. The strengthening of coping capacities usually builds resilience to withstand the impacts of hazards. The key areas of interest which require attention in this field are awareness, education, preparedness, early warning, response, evacuation, safe places and evacuation structures and hazard resilient infrastructure.

Coastal community resilience reflects the capacity to absorb and withstand impacts of hazards, to emerge from disaster events and to adapt efficiently to changing conditions. Economic and social development pressure in coastal areas, increasing population density and distribution, human induced vulnerabilities, together with increasing frequency and duration of storms, long term sea

level rise and other hazards have created conditions for disasters of high severity occurring more frequently. The period of time between disasters and recovery is becoming smaller and coastal communities have restricted capacity and reduced time to recover and emerge. Some communities are continuously facing disasters, event after event, depriving them of time to plan and achieve long term recovery. In effect they lead a life of continuous response to varying disasters. Such communities have to be identified as high risk areas and studies have to be undertaken on special area risk assessment and management.

Building hazard resilient communities requires a full understanding of hazards both episodic and chronic, the frequency of occurrence, the time scale over which they act and the geographic extent of impact. The community should be aware of the impacts on human life, ecosystems, agriculture and infrastructure. A hazard resilient community can only be developed via an understanding of risk leading to reductions in the level of risk through proper land-use practices, reduction in the components that make up vulnerability and improved preparedness. Lower levels of risk reflect a resilient community and this can be achieved via a three pronged approach of reducing the impact of hazards, reducing vulnerability and improving preparedness. The community itself can harness the full potential of their indigenous knowledge in developing measures on improving preparedness. Enhanced coastal community resilience enables populations at risk to adapt to the impacts of coastal hazards with a greater degree of confidence.

Professor Sam Hettiarachchi
Senior Professor, Department of Civil Engineering, University of Moratuwa
and
Vice Chair, UNESCO, ICG, Indian Ocean Tsunami Warning System

Preface

The year 2015 sees the convergence of three global policy frameworks: the post-2015 Framework for Disaster Risk Reduction (March 2015), The Sustainable Development Goals (September 2015; SDGs) and the Climate Change Agreements (December 2015: COP21). This represents an opportunity to emphasise cross-cutting themes, including the importance of research and education across the different global policy agendas in disaster risk reduction, sustainable development and climate-change mitigation and adaptation, and in doing so, to support evidence-based decision-making.

The new Sendai framework for disaster risk reduction includes a strong call for the research and education communities to support the understanding of disaster risk and promote risk-informed decisions and risk sensitive planning from the local to the global levels. It also calls for the coordination of existing networks and scientific research institutions at all levels and all regions. The goal is to strengthen the evidence-base in support of the implementation of the new framework.

Experience over recent years of the impacts of coastal hazards such as tsunamis, storm surges, sea level rise and coastal erosion, has shown that inadequate preparation for, and response to, emergency situations have contributed to widespread damage and the avoidable loss of lives and livelihoods. These hazards set back economic development in both developed and developing economies, and tend to disproportionally affect the most vulnerable in society. The shortcomings in preparation have been due to a lack of warning through poor regional detection and communication systems, but they also reflect inadequate awareness, planning and coordination.

Recent studies and practical experiences of hazards suggest that more attention needs to be paid to the cognitive and normative challenges in positioning early warning systems and preparedness in the wider context of social change in the coastal societies and communities at risk. Better platforms for knowledge sharing need to be established to enable stakeholders to collectively negotiate these challenges, to improve the integration of early warning with other priorities such as livelihoods improvement, natural resource management and community development, and to provide opportunities for critical reflection of 'on-the-ground' experiences and lessons learnt.

Researchers and educators must work with policy-makers and practitioners to co-design and co-produce research that can be used effectively. Higher education must also play a vital role in translating that research into action through its educational programmes.

It is therefore with great pleasure that we welcome delegates to this 5-day multi-disciplinary workshop that aims to build capacity for the development of disaster resilient, connected coastal communities that are able better able to tackle the threat posed by coastal hazards. Through sharing works and experience of different coastal hazards, resilience building and coping mechanisms, and the development of a roadmap, the workshop will stimulate long term links between the UK and Indonesia.

This British Council Researcher Links workshop is being jointly organised by the University of Huddersfield, UK and the Bandung Institute of Technology, Indonesia, in association with the IOC UNESCO Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System.

A rigorous application process was used to identify the early career researchers that will take part in the workshop. The early career researchers are all working in areas related to coastal hazards and resilience, and have a research or academic position (either a permanent post, research contract, or fellowship) at a recognised research institution either in the UK or in Indonesia.

The workshop is being coordinated by Professor Richard Haigh (University of Huddersfield, UK) and Dr Harkunti Rahayu (Institute of Technology Bandung, Indonesia), and will have contributions from other leading researchers, including Professor Dilanthi Amaratunga and Dr Kaushal Kerminiyage (University of Huddersfield, UK), Dr Prih Harjadi (The Agency for Meteorogy,

Climatology and Geophysics) and Dr Hamzah Latief (Institute of Technology Bandung, Indonesia), and Dr Nimal Wijayaratna (University of Moratuwa, Sri Lanka).

This workshop will help researchers grasp the complexity of the challenges, work collaboratively with different disciplines and engage with an array of stakeholders to bridge those gaps. It will embed researchers in a multi- disciplinary and inter-sectoral programme, with input from experts in the fields of built environment, civil engineering and political science. It will expose researchers to different sectors so they are better able to face current and future challenges, and to convert knowledge into evidence based policy development and products aimed at reducing susceptibility to coastal hazards.

More detail about the workshop is contained within this book, including profiles of the organisers and mentors, and biographies and abstracts from each of the early career researchers that is participating. Further information about the event, including post-workshop plans, can also be found at www.disaster-resilience.net/bcrl-workshop.

We very much hope you enjoy the conference and that it provides an appropriate backdrop for tackling challenging questions about how to develop more resilient coastal communities.

Professor Richard Haigh
University of Huddersfield, UK
UK Coordinator

Dr Harkunti P Rahayu
Bandung Institute of Technology, Indonesia
Indonesia Coordinator

Acknowledgements

As the coordinators of this International Workshop on the *Development of Disaster Resilient Coastal Communities to Enhance Economic Development And Social Welfare*, we are delighted to have the opportunity to organise this exciting event.

Holding this event would not have been possible if not for the funding we received from the British Council Newton Researcher Links Programme. This element of the Newton Researcher Links is designed to provide financial support to bring together a UK/partner country bilateral cohort of early career researchers to take part in workshops focussing on building links for future collaboration and enhancing the researchers' career opportunities. The programme is supported by UK government and partner country funding, and forms part of the Newton Fund. We extend our deepest gratitude towards them in supporting this exciting activity. Our thanks also go to the members of the British Council Researcher Links team for their timely responses for all our queries and being supportive whenever we needed advice.

We want to acknowledge the support we received from our mentors during the development of the workshop, planning and its implementation phases: Professor Dilanthi Amaratunga & Dr Kaushal Keraminiyage from Global Disaster Resilience Centre at the University of Huddersfield, UK, and, Dr Hamzah Latief and Dr Prih Harjadi from Bandung Institute of Technology, Indonesia. Their commitment towards the workshop activities and for being mentors during the forthcoming and important post workshop phase is particularly acknowledged.

Further, we want to acknowledge the support and encouragement that was received from Professor Samantha Hettiarachchi, Senior Professor, Department of Civil Engineering, University of Moratuwa, Sri Lanka and the Vice Chair, UNESCO, ICG, Indian Ocean Tsunami Warning System, who has played a key role in the establishment of the Indian Ocean Tsunami Warning System (IOTWS), under UNESCO/IOC, Paris since its inception in 2005 and served as Chairman of Working Group on Risk Assessment for Indian Ocean States for the Inter Governmental Coordination Group for the establishment of the IOTWS (UNESCO/IOC/ICG/IOTWS) from August 2005 to March 2015. Professor Hettiarachchi spearheaded Training Programmes in Coastal Hazards and Tsunami Risk assessment for Indian Ocean States. Major regional training programmes were organised under his leadership in 2009, 2010, 2012, 2013, 2015. These initiatives for Tsunami Indian Ocean Countries' representatives at Government and other policy level initiatives undoubtedly directed us towards proposing this workshop for earlier career researchers.

Dr Nimal Wijeratne from University of Moratuwa, Sri Lanka also deserves a special mention for providing his expert input on coastal hazards and for being there as a mentor whenever we needed help.

We have received exceptional help and support from a number of people, organisations and bodies in the work for this international workshop. The efforts involved with a workshop of this scale are significant and it would not have been possible to organise this workshop without assistance. We particularly would like to extend our appreciation to Dr Ezri Hayat from the Global Disaster Resilience Centre at the University of Huddersfield, UK, and for being the focal point and leading all organisational aspects of the workshop inducing all the logistical and other administrative activities around the workshop.

We want to thank our colleagues who worked very hard for the professional undertaking of the work involved in the tasks that are so often unseen and unrewarded for an international workshop of this scale. We thank Sharon Baines and Sophie Phillips from University of Huddersfield, UK for helping us especially on the finances. The Workshop organising committee from the Research Center for Disaster Mitigation, Bandung Institute of Technology, Indonesia also deserve a special mention. Their Liaison officers are In In Wahdiny, Farah Mulyasari and Aria Mariany, and their supporting staff include L. Rahmat Liaisiouw, Fahmi Aulia, Qurrata Aini, Devina Khairunnisa, and Fany Nur Alqowy N.

Finally, we would like to thank all the participants from Indonesia and the UK for their active participation at the workshop and for their positive commitments towards the post workshop activities. Without the enthusiasm of its participants, workshops will never be successful

Professor Richard Haigh & Dr Harkunti P. Rahayu
Coordinators of International Workshop on the Development of Disaster Resilient Coastal Communities to Enhance Economic Development and Social Welfare

Workshop organisation

Organised by

British Council Newton Fund Researcher Links
Global Disaster Resilience Centre, University of Huddersfield, United Kingdom
Bandung Institute of Technology, Indonesia

In association with

Intergovernmental Oceanographic Commission of UNESCO Indian Ocean Tsunami Warning System

Organising committee

Global Disaster Resilience Centre at the University of Huddersfield, UK
Professor Richard Haigh
Professor Dilanthi Amaratunga
Dr Kaushal Keraminiyage
Dr Ezri Hayat

Research Center for Disaster Mitigation, Bandung Institute of Technology, Indonesia
Dr Harkunti P. Rahayu
Dr Hamzah Latief
Dr Prih Harjadi
In In Wahdiny
Farah Mulyasari
Aria Mariany

RESEARCHER
LINKS

British Council Newton Fund Researcher Links

The Newton Fund is a £375 million fund which, through science and innovation partnerships, promotes the economic development and welfare of poor people in partnering countries. It aims to strengthen science and innovation capacity and unlock further funding to support poverty alleviation. It is delivered through 15 UK delivery partners in collaboration with 15 partner countries. Activities are in three broad areas:

People: increasing capacity for science and innovation in partner countries.

Research: research collaborations on development topics.

Translation: creating collaborative solutions to development challenges and strengthening innovation systems.

For more information visit: www.newtonfund.ac.uk and follow via Twitter: @NewtonFund

University of HUDDERSFIELD
Inspiring tomorrow's professionals

Global Disaster Resilience Centre, University of Huddersfield, UK

A leader in multi-disciplinary research, education and advocacy to improve the resilience of nations and communities

What would it be like to live in a world in which government authorities, businesses, communities and individuals work together to create a society that is able to withstand the effects of unforeseen events and threats? At the Global Disaster Resilience Centre we are working with stakeholders at the global, national, municipal and local level to make this happen.

The Global Disaster Resilience Centre is committed to excellence in research, education and advocacy to improve the resilience of nations and communities to disasters.

With growing population and infrastructures, the world's exposure to hazards is increasing. When disaster strikes, communities may need to be rebuilt physically economically and socially. At the same time, it is vital that any reconstruction activity pro-actively considers how to protect people and their environment, and reduce a community's vulnerability.

The Global Centre for Disaster Resilience is part of the School of Art, Design and Architecture at the University of Huddersfield in the UK. In November 2013, the University of Huddersfield was awarded the Times Higher Education University of the Year. The University excels in enterprise and innovation and in 2012, was named the Times Higher Education Entrepreneurial University of the Year.

Research themes

- Disaster resilience
- Understanding disaster risk
- Contingency planning and resource management
- Private sector engagement in the development of disaster resilience
- Public private partnerships in disaster risk reduction
- Capacity building for disaster mitigation and reconstruction
- Risk management and sustainability
- Post-conflict reconstruction
- Social impact of reconstruction
- Public policy, governance & procurement
- Improved disaster resilience through social media interaction
- Community maturity for improved disaster resilience

International activities

The Centre contributes to national and international committees to advise and guide on strategic and technical issues pertaining to disaster management. The Centre also provides leadership in actively helping to determine the research direction of the field, with a major International journal, periodic conferences and events, and frequent publication of cutting edge research in refereed journals, which are acclaimed nationally and internationally.

Recent projects

The Centre's members are very experienced in obtaining European research councils funding. They lead and contribute to major collaborative international research projects that involve partners across the globe. Some examples include:

- *ANDROID (Academic Network for Disaster Resilience to Optimise educatIonal Development) – a partnership with 67 international partners*

- *CASCADE (Collaborative Action towards Societal Challenges through Awareness, Development and Education) – an international partnership with 17 partners*

The Centre is keen to develop future projects that address societal challenges and international cooperation, inclusive, innovative and secure societies, support for bilateral, multilateral and bi-regional policy dialogue, and networking and twinning activities to facilitate partnering and competence building.

PhD programme

The Centre's PhD programme lays the foundations of inquiry that are relevant to disaster management. Researchers benefit from its strong research culture and there are strategies in place to ensure PhD research is of the highest quality and can achieve sustained growth. The Centre has defined principles that are applied throughout its work.

Protocols are designed to ensure researchers have sufficient time, authority and responsibility to conduct and develop their activities. This mechanism is also designed to maximise the opportunity to invest in and nurture researchers under the mentoring of senior researchers.

International Journal of Disaster Resilience in the Built Environment

ISSN: 1759-5908
Editors: Professor Richard Haigh and Professor Dilanthi Amaratunga
Frequency: 5 issues per year
Indexed in Scopus
Website: www.emeraldinsight.com/ijdrbe

The journal aims to further knowledge and understanding of the link between the built environment and disaster mitigation, response and reconstruction. The journal seeks to:

- Develop the skills and knowledge of the built environment research community and professions working in disaster prone areas, so that they may strengthen their capacity in strategic and practical aspects of disaster prevention, mitigation, response and reconstruction
- Provide a unique forum for novel enquiries into the development and application of new and emerging practices as a source of innovation to challenge current practices
- Promote the exchange of ideas between researchers, educators, practitioners and policy makers
- Influence disaster prevention, mitigation, response and reconstruction policies and practices

International conferences

The Centre organises interdisciplinary conferences and seminars that promote innovation and knowledge exchange on disaster resilience between Higher Education and relevant stakeholders. Members of the Centre established the International Conference on Building Resilience Series in 2008. Most recently, the 4th International Conference on Building Resilience was held from 8th - 11th September 2014, at MediaCityUK, Salford, in the United Kingdom (www.buildresilience.org/2014).

For more information about our research, teaching and advocacy, please contact:

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Institut Teknologi Bandung and School of Architecture, Planning and Policy Development, Indonesia

The present Institut Teknologi Bandung (ITB) main campus is the site of earlier engineering schools in Indonesia. Starting in 1920, Technische Hogeschool (TH) was founded in Bandung, which for a short time, in the middle forties, became Kogyo Daigaku. Soon after the birth of the Republic of Indonesia in 1945, the campus housed the Technical Faculty (including a Fine Arts Department) of Universitas Indonesia, with the head office in Jakarta.

In the early fifties, a Faculty of Mathematics and Natural Sciences, also part of Universitas Indonesia, was established on the campus. Although these institutions of higher learning had their own individual characteristics and missions, they left influence on developments leading to the establishment of the present ITB. Officially ITB was inaugurated by the first president Sukarno on March 2, 1959 by the Indonesian government as an institution of higher learning of science, technology, and fine arts, with a mission of education, research, and service to the community.

The ITB vision's is being an excellent university, dignified, independent, and is recognized worldwide as well as guide the changes that can improve the welfare of the Indonesian nation and the world. Meanwhile its mission is creating sharing and applying science, technology, arts and humanities as well as producing superior human resources and to make Indonesia a better world.

ITB has 13 faculties and schools, including graduate school, as follows: (1) School of Architecture, Planning and Policy Development; (2) School of Electrical Engineering and Informatics; (3) School of Pharmacy; (4) School of Life Sciences and Technology; (5) School of Business and Management; (6) Faculty of Mathematics and Natural Sciences; (7) Faculty of Civil and Environmental Engineering; (8) Faculty of Art and Design; (9) Faculty Industrial Technology; (10) Faculty Mechanical and Aerospace Engineering; (11) Faculty of Mining and Petroleum Engineering; (12) Faculty of Earth Sciences and Technology, and (13) Graduate School.

The School of Architecture , Planning and Policy Development was designed based on thinking that urban and regional planning activities have been in constant development and are increasingly becoming more complex, covering not only the spatial or physical aspects of the sustainable built environment, but also multitude of non-physical aspects involving various disciplines and stakeholders. The school is expected to become the key center for the theory and practice of architecture, urban and regional planning and policy in Indonesia. The program provides high quality of planning education, scholarly planning research, and best planning service for the public. The program educates students who wish to combine social concerns and analytical skills in dealing with the issues of regional and city planning and policy in Indonesia.

Disaster Management and Climate Change Adaptation is one of concern of the School of Architecture, Planning and Policy Development ITB mainly in Regional and City Planning Department. This subject is being compulsory subject for master students enrolls in the Disaster Management concentration on Regional and City Planning Department of Bandung Institute of Technology (ITB). The subject provide opportunity for students to apply the disaster management planning theory in the field and understanding the challenges of disaster management application in the field. The approaches, concepts and technical of planning in solving the problem of disaster risk reduction is conveyed in the subject.

Research Center for Disaster Mitigation (RCDM-ITB)

Research Center for Disaster Mitigation is a multidisciplinary research center under the coordination of Institute for Research and Community Service – Institute of Technology Bandung aiming to play significant role in the area of disaster mitigation at the national, regional and international level, by conducting and promoting fundamental and applied researches of disaster management and mitigation. Besides, the center has obligation to respond the national needs in reducing disaster impact and institutionalizing the research activities related disaster mitigation has been conducting by ITB.

Historically, the Research Group on Disaster Mitigation established in 2003 was the inception of the establishment of Research Center for Disaster Mitigation. In 2005, the research group was transformed into Center for Disaster Mitigation. Due to the increase problem in disaster mitigation in the nationwide and in line with latest research focuses selected by ITB, in 2011 the center was then expanded into a research center named as Research Center for Disaster Mitigation with wider authority and responsibility.

The vision of RCDM is to Becoming an excellent and highly respected research center that could enhance innovation in disaster mitigation at the local, national, regional and international level, as well as contributing significantly in delivering safer communities in Indonesia to overcome the disaster's risk.

Basic capital owned by RCDM to implement various programs being the strength of RCDM are as follows: Support from prominent/ senior researchers, relevant track record dan networking own by ITB, research agenda developed by each research group in ITB, Graduate (Master's and Doctoral programs) programs related to disaster management, and available laboratorium/ software/ library.

As part of university scheme, the activities of RCDM focused on three main tasks, i.e. education, research and community services. All the activities are implementing with support from national and international organization. From national organization, RCDM got support from BNPB (National Disaster Management Agency), BMKG (Meteorology, Climatology and Geophysical Agency), PUSKIM PU (Research Institute of Human Settlement, Department of Public Work), RISTEK (Ministry for Research and Technology), BPBD (Local Disaster Management Agency), etc. While, from international organization, RCDM got support from AIFDR, AUSAID, USAID, Geoscience Australia, UNESCO, UNICEF, UNDP, UNCRD, World Bank, ADPC, etc.

The RCDM's activities in education, research and community service are expected to be able to enhance the role of RCDM in disaster risk reduction at local, national, and regional level.

Intergovernmental Oceanographic Commission of UNESCO Indian Ocean Tsunami Warning System

The Intergovernmental Oceanographic Commission of UNESCO Tsunami Programme aims at reducing the loss of lives and livehoods that could be produced worldwide by tsunamis. In order to accomplish this, the IOC Tsunami Unit supports IOC Member States in assessing tsunami risk, implementing Tsunami Early Warning Systems (EWS) and in educating communities at risk about preparedness measures.

In order to implement effective preventive measures, communities need to be aware of the risk they face. Tsunami risk assessment includes the evaluation of the hazard and the levels of vulnerability of coastal communities. Hazard assessment encompasses the identification of the probability of occurrence of a tsunami based on the identification of possible tsunami sources and the evaluation of historical data. On the other hand, vulnerability assessment aims at identifying the pre-existing physical, social, economical and environmental conditions that make a zone susceptible of suffering important losses and damages. This information is essential for setting up disaster management strategies.

Tsunami early warning systems are based on observation networks of seismometers and sea level measuring stations, which send real time data to national and regional warning centers (TWCs). Based on these observations, TWCs are able to confirm or cancel a tsunami watch or warning. When a potentially destructive tsunami is detected, national authorities should decide if a tsunami warning and an evacuation order must be issued to the public.

It is essential that communities at risk know the actions that need to be undertaken in case of eminent danger. Public awareness campaigns and Standard Operating Protocols must be designed; evacuation routes need to be identified and evacuation drills must be organized. Community-based approaches must be taken into consideration in order to take advantage of traditional coping mechanisms and ensure that all the needs and concerns of individuals at risks are considered.

The IOC Tsunami Programme, through the coordination of regional meetings, capacity building activities and the support of national and regional projects is a key stakeholder for tsunami risk reduction at global level. Four Intergovernmental Coordination Groups (ICGs) corresponding to the regions Pacific, Caribbean, Indian Ocean and Mediterranean have been established to address particular regional needs. The IOC Tsunami Unit is compounded by the Technical Secretariats of these four regional systems, the Head of the Unit, the International Tsunami Information Centre (ITIC) and technical and professional staff. Operational tsunami warning centres provide tsunami advisories, watches and warnings to the four regions. Additionally, each ICG counts on the strategic advisory of specialized Working Groups whose members are professionals from key disaster management and research institutions.

Meet the team

Coordinators

Professor Richard Haigh, Co-Director of the Global Disaster Resilience Centre, University of Huddersfield, UK

Dr Harkunti P Rahayu, Faculty Member of Department of City and Regional Planning, School of Architecture, Planning and Policy Development, Institute Technology Bandung, Indonesia

Mentors

Professor Dilanthi Amaratunga, Co-Director of the Global Disaster Resilience Centre, University of Huddersfield, UK

Dr Prih Harjadi, Deputy Director for Geophysics, The Agency for Meteorogy, Climatology and Geophysics, Indonesia

Dr Kaushal Keraminiyage, Senior Lecturer, Global Disaster Resilience Centre, University of Huddersfield, UK

Dr Eng Hamzah Latief, Researcher and Lecturer at Study Program of Oceanography, Institute of Technology Bandung

Invited international expert

Dr Nimal Wijayaratna, Senior Lecturer, Department of Civil Engineering, University of Moratuwa, Sri Lanka

Coordinator: Professor Richard Haigh

Position and institution: Professor of Disaster Resilience/Director, Global Disaster Resilience Centre, University of Huddersfield, UK

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Biography

Richard Haigh is a Professor and Co-Director of the Huddersfield Centre for Disaster Resilience at the University of Huddersfield. He is the Founding Editor-In-Chief of the International Journal of Disaster Resilience in the Built Environment, Co-Chair of the 2008, 2011, 2013 and 2014 International Conferences on Building Resilience, and Co-Chair of the 2014 CIB International Conference on Construction in a Changing World. His research interests include the conceptual understanding of resilience, the reintegration and rehabilitation of conflict-affected communities in Sri Lanka, and engagement of the private sector in the development of societal resilience.

Richard has secured sixteen research grants since 2005 in the areas of disaster resilience, construction management and education, covering issues such climate change adaptation, social impact of post-conflict reconstruction, gender, curricular development, knowledge management, capacity building for resilience, and education in the built environment.

Richard has given over 50 invited speeches and keynote presentations for audiences in the UK, Australia, New Zealand, USA, Nepal, Sri Lanka, Bangladesh, Malaysia, Hong Kong, Canada, Estonia, Lithuania, and South Africa. He has also published over 25 peer reviewed journal articles, 1 edited book, 7 book chapters, and 13 reports for a variety of stakeholders. A full list of Richard's publications, projects, and national and international activities can be found at www.richardhaigh.info.

Coordinator: Dr Harkunti P Rahayu

Position and institution: Faculty Member of Department of City and Regional Planning, School of Architecture, Planning and Policy Development, Institute Technology Bandung

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Biography

Harkunti P Rahayu was born in Blitar, East Java, Indonesia in January 30, 1960. She attended ITB-Institute Technology Bandung in Department of Civil Engineering from August 1980 to March 1986, with the title of undergraduate thesis "Computation Modelling of Traffic Queue in Roundabout". She joint academic faculty in Civil Engineering Department of ITB from 1990 – 2008, then joint the Urban and Regional Planning Study Program from 2008 – now. She took higher degree in Kochi University of Technology Japan from October 2009 to March 2012, with title of dissertation "Integrated Logic Model of Tsunami Early Warning System". From 1986 to 1996, she has conducted several research and works related with risk management in construction, and risk allocation in construction contract. Then from 1997, she has put her interest and focus of research and works on disaster mitigation and management, starting with development of Earthquake Disaster Risk Action Plan for the Bandung City, modules and guideline for School Earthquake Preparedness Plan, UNCRD Manual for Community Based Disaster Management, Capacity Building and Development of SOP Community Based Early Warning System for Jakarta Flood. After 2004 tsunami works on tsunami DRR, such as Coordinator for National Tsunami Simulation/Exercise in Bali 2006 and Cilegon Banten 2007, as well as several national technical guidelines for Tsunami Vertical Evacuation Shelter Design and Planning, Tsunami Evacuation Planning, Tsunami Signage Design and Planning, Tsunami Exercise Planning. Beside that several national and international research grant on tsunami DRR have been awarded, i.e. Ristek, Dikti, ITB, NSF, USAID and many others.

Mentor: Professor Dilanthi Amaratunga

Position and institution: Professor of Disaster Management/Director, Global Disaster Resilience Centre, University of Huddersfield, UK

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Biography

Professor Dilanthi Amaratunga is a leading expert in disaster resilience with an international reputation. She current leads the Global Disaster Resilience Centre, a global leader in inter-disciplinary research, education and advocacy to improve the resilience of nations and communities at the University of Huddersfield, UK. Her research interests include disasters and the built environment; capacity building; socio-economic measures for disaster risks; gender and protection; Preparedness for response, recovery and reconstruction, conflict affected societies; Risk management and sustainability; and Public policy, governance and procurement.

Her research leadership in disaster management has been recognized in the international research community by appointing her as the Editor-in-chief of the International Journal of Disaster Resilience in the Built Environment (www.emeraldinsight.com/ijdrbe.htm). She also led the Editorial Team of the Global Assessment Report 2015 key papers published by the United Nations International Strategy for Disaster Risk Reduction.

She has project managed to successful completion several research projects generating significant research outputs including CASCADE, with 17 international partners. To date, she has produced over two hundred publications, refereed papers and reports, and has made over 50 key note speeches in around 30 countries, over 80 invited speeches and keynotes for audiences in the UK, Australia, New Zealand, USA, Nepal, Sri Lanka, Bangladesh, Malaysia, Hong Kong, Canada, Estonia, Lithuania, and South Africa

Full details of Dilanthi's publications, projects, and national and international activities can be found at www.dilanthiamaratunga.net.

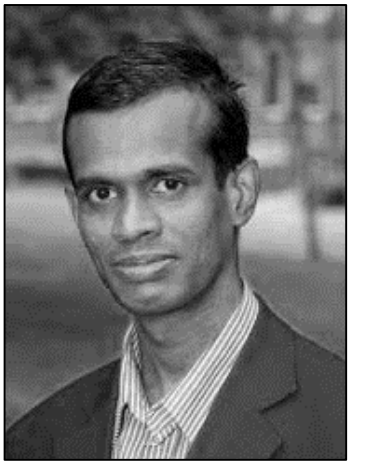
Mentor: Dr Prih Harjadi

Position and institution: Deputy Director for Geophysics, The Agency for Meteorogy, Climatology and Geophysics, Indonesia

Biography

Dr Harjadi will bring expertise in geophysical data and information, as well as risk assessment. In addition, Dr Harjadi brings considerable experience in understanding the links between knowledge creation and knowledge application, which will inform sessions on research impact.

Mentor: Dr Kaushal Keraminiyage



Position and institution: Senior Lecturer, Global Centre for Disaster Resilience,

Email address: k.keraminiyage@hud.ac.uk

Biography

Dr Kaushal Keraminiyage has over 10 years of experience as an academic in the Higher Education sector both in the UK and Sri Lanka. He is a Senior Lecturer at the University of Huddersfield. His teaching interests are in Quantity Surveying related subject modules both at Masters and Undergraduate levels. Dr Keraminiyage is also an experienced researcher with a good publication profile and funded research projects. His research publications include book chapters, refereed journal and refereed conference papers and various high impact reports. He is very much active in competitive research bidding and is a co-investigator of the LLP funded BELLCURVE and CADRE projects and TEMPUS funded CENEAST project. During the last few years he has actively been engaged in organising high profile research conferences at various international locations creating strong links with various Built Environment and Disaster Management experts and stakeholders. Dr Keraminiyage is currently supervising number of PhD students, and engaged in conducting PhD assessments. He has been invited to conduct number of guest lectures at international academic and practitioner forums and facilitated number of doctoral training programmes both nationally and internationally and is a keen supporter of open source software and educational resources. He is keen to utilise his knowledge to create better virtual collaborative environments to address teaching, learning and research needs in the field.

Mentor: Dr Eng Hamzah Latief

Position and institution: Researcher and lecturer at Study Program of Oceanography, Institute of Technology Bandung

Email address: hamzahlatief1410@yahoo.co.id; raihalf@gmail.com

Biography

Hamzah Latief was born in Siwa, South Sulawesi, in October 14, 1963 and attended Institute of Technology Bandung (ITB), Department of Geophysics and Meteorology, from 1984 to 1989. Title of End Project was Mathematical Model and Computer Simulation for Shoreline by Using One-line Model (1989). In 1991 He became a Lecturer in same department until now. He attended ITB for Master from 1990 to 1993, with major of Physical Oceanography. Title of the Thesis was Numerical Model for Nearshore Waves (1993). Furthermore he attended for PhD at Disaster Control Research Center, Tohoku University, Japan, from 1997 to 2000, title of Dissertation was Study on Tsunamis and Their Mitigation by Using Green Belt in Indonesia (2000). In 2001 to 2004 he became Head of Department of Oceanography - ITB. In 2005-2007 He became Secretary of Center for Marine and Coastal Research (CMCR) ITB, and then became Head of CMCR-IITB in 2007 up to March 2012. Since 2005 until now He was a Senior Researcher on Center for Disaster Mitigation ITB and since 2010 until he was a Senior Researcher on Center for Climate Changes ITB. He got award from Indonesian Government as "Wira Tangguh" as dedication on tsunami research.

International expert: Dr Nimal Wijayaratna

Position and institution: Senior Lecturer, University of Moratuwa, Sri Lanka

Email address: nimalw@uom.lk

Biography

Nimal Wijayaratna was born in Colombo, Sri Lanka. He has graduated from the University of Moratuwa, Sri Lanka in 1993 with a B.Sc. Engineering (First Class Honours) specialised in Civil Engineering. He won the prize for the most outstanding graduate in Water and Environmental Engineering during graduation. He obtained M.Eng. Degree from the Asian Institute of Technology (AIT), Thailand in 1997 specialising in Coastal Zone Engineering and Management. He received the Hodaka price awarded to the best graduate at AIT in Coastal Zone Engineering and Management. His Masters research was a development of a mathematical model to simulate oil spill trajectories in the South China Sea. In the year 2000, he received his PhD from the Yokohama National University, Japan. He has developed a mathematical model to simulate the sea wave breaking during his doctoral research study. Upon completion of the graduate studies, he has returned home in the year 2000. Since then, he is working as an academic and as a consultant in Hydrology, Drainage and Coastal Engineering. He was trained and involved in tsunami wave propagation modelling, hazard mapping and risk assessments in Sri Lanka and in Japan.

Features of the workshop

Keynote speakers

In addition to presentations by the coordinators and mentors of the workshop, we are delighted to welcome Professor Widjaya Martokusumo, Dean of School of Architecture, Planning and Policy Development at Bandung Institute of Technology to provide opening remarks.

Dr Subandono, Marine and Fishery Department, Institute of Technology Bandung, Indonesia, and Dr Nimal Wijayaratna, University of Moratuwa, Sri Lanka will provide keynote addresses on current work and emerging challenges associated with the development of disaster resilient coastal communities.

Site visit to BMKG Jakarta

The workshop programme includes a site visit to Ina-TEWS (Tsunami Early Warning System) with NTWC (National Tsunami Warning Center), Ina-MEWS (Meteorology Early Warning System) with Tropical Cyclone Warning Center, Ina-CEWS (Climatology Early Warning System) at BMKG.

During the visit, Dr Moch Ryadi will deliver a lecture on the state of the art on the warning system and the role of our warning system in the Indian Ocean Basin, Pacific Basin and South China Sea Basin.

Facilitated participant presentations sessions

Each participant will present their work to the other delegates and provide an overview regarding their current research interest and expertise. The presentation will be based on the abstract submitted and included within this book. The session will also be an opportunity to improve presentation skills, identify links to other work, and get constructive feedback from the participants.

All presenters will use the PechaKucha 20x20 format for their presentation. This is a simple presentation format where you show 20 images, each for 20 seconds. The images advance automatically and you talk along to the images.

Development of the research roadmap

The workshop will develop a roadmap that reviews the current state of early warning and preparedness, and sets out the work required and major challenges and opportunities around improving awareness, planning and coordination. This includes addressing cognitive and normative challenges in positioning early warning and preparedness in the wider trajectories of social change in societies and communities at risk. The roadmap will set out action plans for immediate, short-term and long-term research work and capacity building.

The roadmap will form the basis for future cooperation among the workshop participants, but also be an important mechanism by which to initiate discussions with relevant stakeholders.

Skills development sessions

Publishing your research: The session will look at academic writing, and making successful conference and journal publications.

Obtaining funding and support for research: Good practices that need to be adhered to when applying for research grants will be discussed. Current and future funding opportunities available for disaster management research opportunities will be presented and discussed.

Panel discussions

Current landscape and future opportunities for improving coastal resilience: An expert panel to lead a discussion about the current landscape and future opportunities for improving coastal resilience in Europe and the Indian Ocean. The discussion will encourage participants to consider whether more attention needs to be paid to the cognitive and normative challenges in positioning EWSs in the wider trajectories of social change in societies and communities at risk.

Challenges associated with cross/inter disciplinary and inter-sectoral working: An expert panel will lead a discussion about the need for and challenges associated with cross- and inter-disciplinary working, as well as working across sectors, in order to address the complexity of developing coastal resilience.

Pathways to impact: An expert panel will lead a discussion about how to convert knowledge into evidence based policy development and products aimed at reducing susceptibility to coastal hazards.

Developing your research profile: An opportunity to discuss personal and career development planning for early career researchers.

Open educational resources

All materials delivered during the workshop will be made available as open education resources so that they are released under an open license (creative commons) that permits no-cost access, use, adaptation and redistribution by others. This will ensure that a much wider constituency of early career researchers from Indonesia and the UK, as well as interested parties from other backgrounds and countries, can benefit from the materials presented. Online post-doctoral sessions will also be organised six months and one year after completing the workshop.

The open educational materials will be hosted on the ANDROID disaster resilience network OER platform: http://www.disaster-resilience.net/index.php/component/oer/

Social events

An important aspect of the workshop is getting to know different people working in this research area, in particular to encourage future UK and Indonesian collaboration. The workshop programme includes several social events..

Participants will have the opportunity to enjoy the Angklung (bamboo) orchestra and traditional Sundanese food at Saung Angklung.

The main workshop dinner will be held at Siera Café, with entertainment provided by ITB student music group and Sundanese traditional dancing.

Links to the Intergovernmental Coordination Group (ICG) of Indian Ocean Tsunami Warning and Mitigation System (IOTWS)

This workshop is being organised in association with the Intergovernmental Coordination Group (ICG) of Indian Ocean Tsunami Warning and Mitigation System (IOTWS), which has a mandate to enhance awareness and implementation by Member States of the procedures for risk assessment and effective functioning of the "last mile" of the early warning system within communities. This mandate corresponds to priority aims identified in the Sendai Framework of 2015 on DRR (Disaster Risk Reduction) – to achieve a substantial reduction of disaster losses, in lives, and in the social, economic and environmental assets of persons, communities and countries over the next 15 years. In particular, they include "understanding disaster risk" and "enhancing disaster preparedness for effective response, and to 'Build Back Better' in recovery, rehabilitation and reconstruction".

The ICG, with the support of UNESCO, has already constructed a substantial foundation for the achievement of these aims through its role as an enabler and facilitator. It has conducted regional and country-specific training workshops, launched UNESCO's regional Tsunami Information Centre for the Indian Ocean in Jakarta, IOTIC, and published procedural guidelines. The latest guidelines, published in June 2015, are revised edition of the UNESCO-IOC Manuals and Guides No. 52, "Tsunami Risk Assessment and Mitigation for the Indian Ocean: Knowing your Tsunami Risk – and what to do about it".

During the workshop, there will be an opportunity to explore how participants can contribute to the ICG's goal to establish a sustainable mechanism for training in coastal hazards and tsunami risk assessment and management for continuing professional development.

The overarching goal of this initiative is the establishment of a regional self-perpetuating fund of knowledge and experience in tsunami risk assessment and preparedness that will promote the implementation of these activities by Member States within a multi-hazard context and a framework of Integrated Coastal Area Management (ICAM). Such a fund would serve as a regional training resource for continuing professional development. It would facilitate the implementation of coastal hazard risk reduction by Member States as a matter of routine for the foreseeable future to the benefit of communities under threat from coastal hazards, in particular inundation by tsunamis or storm surges.

Call for papers for a special issue of the International Journal of Disaster Resilience in the Built Environment (IJDRBE)

ISSN: 1759-5908

Editors:
Professor Dilanthi Amaratunga & Professor Richard Haigh
Global Disaster Resilience Centre, University of Huddersfield, UK

Guest Editor:
Dr Harkunti P Rahayu, Faculty Member of Department of City and Regional Planning, School of Architecture, Planning and Policy Development, Institute Technology Bandung, Indonesia

Authors of selected abstracts presented in the workshop will also be invited to submit a full paper for publication in a Special Issue of the International Journal of Disaster Resilience in the Built Environment.

This is the only journal in the field to promote research and scholarly activity that examines the role of building and construction to anticipate and respond to disasters that damage or destroy the built environment. Although the origins and causes of disasters are varied, the consequences to human society are frequently similar: extensive loss of life, particularly among vulnerable members of a community; economic losses, hindering development goals; destruction of the built and natural environment, increasing vulnerability; and, widespread disruption to local institutions and livelihoods, disempowering the local community. In particular, it aims at developing the skills and knowledge of the built environment professions and will strengthen their capacity in strategic and practical aspects of disaster prevention, mitigation, response and reconstruction to mitigate the effects of disasters nationally and internationally. The journal publishes original and refereed material that contributes to the advancement of the research and practice, and provides contributing authors with an opportunity to disseminate their research and experience to a broad audience.

The coverage of the journal includes, but is not limited to: Disaster mitigation, response and reconstruction; Disaster risk reduction; Physical, social and economic resilience in the built environment; Reconstruction and sustainable development; Participatory approaches to reconstruction; Empowerment of women and vulnerable groups; Project management for post-disaster reconstruction; Waste management; Business continuity management; Knowledge management; Governance and transparency; Corporate social responsibility; Law and regulatory frameworks; Conflict sensitive reconstruction; and, Social impact of reconstruction. Further details on coverage details of the journal is available at:

http://www.emeraldgrouppublishing.com/products/journals/author_guidelines.htm?id=ijdrbe

The Journal is Indexed in: British Library, Construction and Building Abstracts, ICONDA - The International Construction Database, Business Source Premier (EBSCO), ABI INFORM Global (ProQuest), Cambridge Scientific Abstracts (ProQuest), INSPEC and SCOPUS. The SCOPUS impact factor for the journal in 2013 is one of the highest for a new journal.

In addition to the special issue call, if you have any ideas for a paper that may fall within the scope of the journal, the Editors are happy to discuss this with you. They can be contacted at:

Professor Dilanthi Amaratunga (email: d.amaratunga@hud.ac.uk)
Professor Richard Haigh (email: r.haigh@hud.ac.uk)
Global Disaster Resilience Centre, University of Huddersfield, UK
Journal web page: www.emeraldinsight.com/ijdrbe.htm

Linked projects

ANDROID (Academic Network for Disaster Resilience to Optimise educatIonal Development)

This workshop is being organised in association with ANDROID (Academic Network for Disaster Resilience to Optimise educatIonal Development), an Erasmus academic network that aims to promote co-operation and innovation among European HE to increase society's resilience to disasters of human and natural origin. The network has sixty-seven representatives from thirty-one countries, twenty-eight in the EU, as well as organisations from Australia, Canada and Sri Lanka. The network's teaching and research is concerned with what resilience is, what it means to society, and how societies might achieve greater resilience in the face of increasing threats from natural and human induced hazards.

In order to achieve this aim, ANDROID: 1) Promotes discourse among European applied, human, social and natural scientists to, pool their results and findings, discuss methods and develop inter-disciplinary explanations that increase society's resilience to disasters; 2) Describes, analyses, and compares the capacity of European cities and HE to address disaster risk, and thereby reinforce the link between education and society; 3) Builds the capacity of HE to address emerging challenges in disaster resilience, strengthen the link between research and teaching, and inform policy development.

- The *ANDROID virtual network* forms a virtual hub for the project. Using Joomla, a free and open source content management platform, the virtual network provides a broad range of functionality that facilitates administration and coordination across partner institutions: collaboration and communication tools; information handling and exchange; project management tools; data collection tools; and, intra-network dissemination.
- The *Doctoral School* is a fully coordinated, innovative, and international interdisciplinary doctoral teaching and research programme focused on the most salient issues and features shaping society's ability to tackle the challenges posed by natural and human induced hazards. The Doctoral School provides complementary and innovative research training programmes aimed at honing the students' skill set, and draws on the wide disciplinary base of the network's partners to promote inter-disciplinary working for doctoral students.
- A *pan-European survey* has identified, collated and disseminated good practices for inter-disciplinary working in research and teaching that explores what resilience is, what it means to society, and how societies might achieve greater resilience in the face of increasing threats from natural and human induced hazards.
- The *inventory of European disaster resilience education* describes, analyses, and compares disaster resilience related education programmes in order to establish existing capacity among European HEIs to address the threat posed by hazards of natural and human origin.
- A survey assesses the *capacity of local government's public administrators* in European urban areas to address disaster risk.
- The network's *Special Interest Groups (SIGs),* which represent the particular research and teaching concerns of groups of members, defines a scope and work plan, organises seminars, contributes to the network newsletter, and communicates regularly through the Virtual Network. Each SIG has contributed to a report on future research directions in disaster resilience research, and the implications for education.
- An *Open Educational Resources (OER) platform* hosts digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research.

- A *series of annual conferences* across Europe brings together Network members, lecturers and researchers in universities and other higher education institutions with an interest in disaster resilience, as well as those in NGOs and policy fields.

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Contact the Secretariat

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E-mail: android@disaster-resilience.net
Website: www.disaster-resilience.net

CASCADE (Collaborative Action towards Societal Challenges through Awareness, Development, and Education)

Highlighted by the European Commission report (2012) on 'Enhancing and focusing EU international cooperation in research and innovation', global challenges are important drivers for research and innovation. Thus, the EU needs to strengthen its dialogues with international partners to build critical mass for tackling these challenges. However, critical mass is lacking in many cases and the strategy driving the development of the actions is not always clear. This was one of the conclusions of the FP7 interim evaluation, which stated that there needs to be an 'intensification of international cooperation' activities focused on 'engaging with partners outside of Europe on equal terms and in programmes and activities of high mutual interest'. The same report recommended the 'coherent strategic development 'of the Union's policy for international cooperation in research and innovation. Therefore, this action will, overall, aim to achieve the main objectives of the European Commission (2012) for International cooperation in research and innovation:

1. Strengthening the Union's excellence and attractiveness in research and innovation as well as its economic and industrial competitiveness by creating win-win situations and cooperating on the basis of mutual benefit; by accessing external sources of knowledge; by facilitating access to new and emerging markets; and by agreeing on common practices for conducting research and exploiting the results;
2. Tackling global societal challenges by developing and deploying effective solutions more rapidly and by optimising the use of research infrastructures;
3. Supporting the EU's external policies through international cooperation in research and innovation as an instrument of soft power and a mechanism for improving relations with key countries and regions.

In this context, the *overall objective* of CASCADE (Collaborative Action towards Societal Challenges through Awareness, Development, and Education) is to prepare ground for a future research programme that targets South Asian Countries and promotes bi-regional coordination of Science & Technology (S&T) cooperation, including priority setting and definition of S&T cooperation policies.

The specific objectives of CASCADE are to: compile a regional position paper that identifies global challenges and research priorities; map and develop an inventory of national and regional stakeholders related to global challenges; and, raise awareness on research & innovation priorities for fostering cooperation and towards building mutual understanding on how to address common global societal challenges. CASCADE targets and has the participation of all South Asian countries specified in the call: Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka.

Objectives of the project

1) Identify societal challenges on which to focus the cooperation and justify them in terms of common interest and mutual benefit relevant to the targeted countries in Southern Asia. In this context, following broad Horizon 2020 - The Framework Programme for Research and Innovation will be considered:
   a) Health, demographic change and wellbeing;
   b) Food security, sustainable agriculture, marine and maritime research and the bio-economy;
   c) Secure, clean and efficient energy;

d) Smart, green and integrated transport;
e) Climate action, resource efficiency and raw materials;
f) Inclusive, innovative and secure societies

2) Provide up to date analytical evidence on key stakeholders and their competences in Southern Asia
3) Support, where relevant, the training and extension of the network of FP Contacts in the region, in particular with the view of increasing awareness about cooperation opportunities offered by Horizon 2020

S&T objectives and measurable outputs

The overall objective of CASCADE is to prepare ground for a future INCONET programme that targets South Asian Countries and promotes bi-regional coordination of S&T cooperation, including priority setting and definition of S&T cooperation policies.

The specific objectives of CASCADE are to: compile a regional position paper that identifies global challenges and research priorities; map and develop an inventory of national and regional stakeholders related to global challenges; and, raise awareness on research & innovation priorities for fostering cooperation and towards building mutual understanding on how to address common global societal challenges. CASCADE targets and has the participation of all South Asian countries specified in the call: Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka.

The objectives are linked to an interacting set of work packages and measurable / verifiable outputs. In addition to the 3 RTD work packages (WP2 – Identify global challenges relevant to Southern Asia; WP3 – Identify and map stakeholders in Southern Asia; WP4 – Raise awareness of Horizon 2020 and related schemes) and there are 2 further work packages dealing with project management (WP1) and dissemination and exploitation (WP5).

Participants

University of Salford (USAL)	UK
University of Huddersfield (HUD)	UK
University of Central Lancashire (UCLAN)	UK
Tallinn University of Technology (TUT)	Estonia
Vilnius Gediminas Technical University (VGTU)	Lithuania
University of Bologna (UNIBO)	Italy
Fondation pour la recherche stratégique (FRS)	France
Nangarhar University (NU)	Afghanistan
Patuakhali Science and Technology University (PSTU)	Bangladesh
Royal Institute of Management (RIM)	Bhutan
Institute of Engineering, Tribhuvan University (IOE)	Nepal
Volunteers for Development Nepal (VFD)	Nepal
University of Peshawar (UoP)	Pakistan
Local Councils Association of the Punjab (LCAP)	Pakistan
University of Moratuwa	Sri Lanka
Federation of Sri Lankan Local Govt. Authorities (FSLL)	Sri Lanka
Asian Disaster Preparedness Center (ADPC)	Thailand (presence in all targeted countries)
ECO CARE (ECO)	Maldives

For further information:
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Website: www.cascade-inconet.eu

CADRE (Collaborative Action towards Disaster Resilience Education)

There are wide-ranging origins and causes to the many disasters that have affected communities across Europe and globally with ever-greater frequency. If construction researchers and practitioners are to be able to contribute to reduce risk through resilient buildings, spaces and places, it is important that capacity is developed for modern design, planning, construction and maintenance that are inclusive, inter-disciplinary, and integrative. In order to address this challenge, CADRE will develop an innovative professional doctorate programme that addresses the requirements for lifelong learning and actively promotes collaboration between European HEIs, industry and the community. This novel programme will address the career needs, and upgrade the knowledge and skills, of practising professionals working to make communities more resilient to disasters, and particularly those in, or who aspire to, senior positions within their profession. The candidates will undertake research aimed at making a contribution to the knowledge of professional practice and will involve applied rather than pure research. It will require candidates to establish the research problems from the viewpoint of industry and the community, thus encouraging healthy communication channels between ICU and establishing a strong platform for through life learning. In this context, the project, will improve the quality and relevance of higher education through active cooperation between Higher Education Institutes and partners from outside academia, including construction professional bodies, local/national/international bodies and social partners.

CADRE is an ERASMUS multilateral project supported by an EU grant. The project will run for three years and is led by the University of Huddersfield's Global Disaster Resilience Centre, UK. The Huddersfield team are working in conjunction with four European based institutions and two partners from Sri Lanka who will bring a much-needed international perspective to the project

Aim and objectives

CADRE aims to address current and emerging labour market demands in the construction industry to increase societal resilience to disasters.

CADRE will achieve this aim by: 1) Establishing a framework for ICU integration to address societal concerns; 2) Developing and testing an innovative professional doctoral programme that integrates professional and academic knowledge in the construction industry to develop societal resilience to disasters; 3) Creating world-class curricula and modules to support the programme and address current and emerging capacity gaps in the development of societal resilience to disasters; 4) Exploiting ICT to enable cross-border cooperation in the sharing and delivery of educational resources that support the professional doctoral programme.

Methodology

CADRE will achieve these objectives by: Managing partners to deliver outputs and achieve intended outcomes (WP1&2); Identifying market needs across a range of stakeholders (WP3); Developing a framework for ICU integration (WP3); Developing a professional doctorate programme based on a clear demand and involvement from industry and communities (WP3); Testing and validating the professional doctorate programme within the framework of lifelong learning and ICU interaction (WP4); Developing industry and community informed Open Educational Resources (OERs) for disaster resilience education (WP5); Planning to deliver the programme and sustain its impact beyond its initial funding (WP6); and, Raising awareness and promoting a common understanding among stakeholders of the importance of disaster resilience education and the essential role of European HEIs in improving society's ability to withstand the threat posed by hazards (WP7).

A constructive & developmental research approach has been selected as the overarching research methodology. This approach will begin with a detailed market needs analysis, capturing inter-disciplinary needs across a range of stakeholders and countries. Alongside this, an ICU framework will be developed to identify how integration can take place and how the effectiveness of such integration can be measured. These two activities will culminate in the first milestone. To ensure that the proposed programme addresses a global, rather than just European perspective, input will also be sought from a third country partner. Based on these inputs, the development of the academic content of the joint professional doctorate programme and the associated processes will begin. This will involve the identification of the common and specific research areas, and potential for cooperation among partner organisations. This will also result in the second major milestone, the DProf programme specification (WP3). The next phase will involve development of Open Educational Resources (WP5), with a specific focus of imparting the knowledge and skills needed for undertaking doctoral research in disaster resilience in the built environment. In doing so, the programme will ensure that the specific specialities and expertise of disaster management and resilience in the built environment from the partner organisations will be integrated to the proposed joint doctoral programme. The final implementation phase will involve programme validation (WP4). The ICU framework will be a central tenet of this validation.

Exploitation and valorisation (WP6) will ensure that CADRE has a sustained impact on the target groups and achieves it intended outcomes. It will ensure that programme and learning resources are put to good use through project engagement with relevant stakeholders across Europe and beyond. Dissemination (WP7) will raise awareness and promote a common understanding among stakeholders of the importance of disaster resilience education and the essential role of European HEIs in improving society's ability to withstand the threat posed by natural and human induced hazards.

Consortium

The CADRE consortium is composed of 7 partners from 5 different countries, representing organisations involved in research and development of improving the resilience of society to catastrophic natural hazards. The team will work together to pool their results, build inter-disciplinary explanations, discuss findings at conferences, write and publish papers, and inform policy development. List of partner institutions are given below.

Global Disaster Resilience Centre, University of Huddersfield
Vilnius Gediminas Technical University
Tallinn University of Technology
Northumbria University
United Nations International Strategy for Disaster Reduction
University of Moratuwa
Federation of Sri Lankan Local Government Authorities

Further information

For further information, please contact:

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PARTICIPANT BIOGRAPHIES AND ABSTRACTS

Dr Amirullah

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Dr Amirullah is a lecturer and researcher in education. His research interest is literacy and biliteracy, resilience, school, identities and investment. His recent interest particularly in the disadvantaged communities, rural and coastal communities. He has participated in a number workshops related to communities empowerment and resilience issues. His willing to collaborate in conducting research on resilience, literacy and schools in rural and coastal communities.

Safe and Resilient Cultures of School

The aim of this research is to identify the pattern of safe and resilient cultures of school. Using the cultural framework of Bolman and Deal's (2008): structural, political, human resources and symbolic frames enable us to identify nations' resilience and safe culture to disaster. The site of this study is located in eastern part of Indonesia particularly in prone zone areas. This study will involve a series of semi-structured interviews, participant observations and documents from coastal communities. The interviews will involve community leaders, government officer, educators and local stakeholders surrounding coastal communities. The significance of this study is that it will contribute to the current development of theoretical debates in the cultures of safe and resilient schools. Practically, it will contribute to the local and national strategies of building nation's resilience to disaster.

Keywords: Safe, resilience, cultures, communities, Indonesia

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Education

2012-now: Doctoral Program, School of Architecture, Planning and Policy Development, Institute of Technology Bandung

1998-2000: Master Degree, Architecture and Building Engineering, Tohoku University, Japan

1988-1993: Bachelor Degree, Architecture Engineering, Institute of Technology Bandung

Professional organisation

2011-now: Associate Architect, Association of Indonesian Architect (IAI)

Publications

1] Anita, J., and Sudradjat, I., (2015), Housing Adjustments as A Response to Flood and Land Subsidence in Muara Angke, North Jakarta

2] Anita, J. and Pratiwi, W.D. (2014), Housing Adjustment as Adaptation Strategy for The Future in Flood Prone Settlement

3] Anita, J., (2014), Constraints to Greening The Environment in Muara Angke Fishing Settlement, North Jakarta

4] Anita, J., (2013), Structural and Non-Structural Approaches as Flood Protection Strategy in Muara Angke Settlement

5] Anita, J. and Harun, I.B., (2013), Raising Floor Elevation of House as Effort to Improve the Quality Housing in Flood Prone Settlement, Case Study: Muara Angke Settlement

6] Anita, J. and Latief, H., (2013), Coastal Flooding Adaption By Housing Adjustment in Coastal Settlements, Case Studies : Muara Angke, North Jakarta and Tambak Mulyo, North Semarang

Housing Adjustments and Transformation of Living as a Response to Coastal Flooding in Muara Angke, North Jakarta

Muara Angke is a delta in North Jakarta surrounded by Jakarta Bay in the north, Asin River in the east, and Adem River in the west. It was marshes and mangrove forests until the 1970s and built by government of DKI Jakarta in 1977 to accommodate fisherman or people who work in the field of fisheries in North Jakarta such as owners of fishing boats, crews, fishing workers, salted fish laborers, and fish traders. As a delta, it is unstable regions that flood occurred several times, the last major flood occurred in 2007, 2012, and 2013. Flooding occurs due to several factors such as land subsidence, sea level rise, spring tide, heavy rainfall, river silting, and the dike collapsed. The land subsidence of Muara Angke is about 0-15 cm/ year, meanwhile, the sea level rise average is 1.45 cm/year. Residents do adjustment to their houses as a response to flooding, so that they can stay at home even during floods. There are several patterns of adaptation to the physical building of the houses. The objective of this research is to identify the patterns of housing adjustments and living transformations. The research method was conducted by distributing questionnaires to collect data from 120 purposive respondents, also made observation and interview from January until September 2014. The results of this research shows that the pattern of housing adaptation includes elevating the floor, raising the ceiling, expanding become two and three storey houses, replace the floor and roof material, and using materials easily dismantled. Housing adjustments cause changes in people's daily lives, such as the majority of respondents did not have furniture in the living room, they are also reluctant to plant trees because damaged in the event of flooding. The conclusion that the ability of adaptation is closely related to income and education of occupants, and it changes their lifestyle.

Keywords: Flood, housing adjustment, transformation, Muara Angke

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Dr. Adiwan has a solid education background and extensive working experience in urban and regional planning, regional economics, economic geography, and trade liberalisation. This has equipped him with a comprehensive interest and capacity in the regional development studies. He completed his PhD from Bartlett School of Planning, University College London (UCL), United Kingdom and was a Postdoctoral Fellow at the Institute of Southeast Asians Studies (ISEAS), Singapore.

He has accumulated a rich knowledge on managing research and non-research projects through working solely or within a team. He is a national committee member of Indonesian Urban and Regional Planning Association and has broad experiences in both bureaucracy and academic environments.

As a recently recruited Assistant Professor in the Urban and Regional Planning Program in Institute Technology Bandung (ITB), Adiwan is excited to start his academia career by combining previous research in regional economics and the disaster management studies, which is currently an emerging topic in ITB. In this sense, the integration of regional economics and GIS will be beneficial for the disaster management studies group in the university.

Disaster Impact on Economic Growth: Evidence from Indonesian Coastal Regions

In this paper we estimate the impact of disaster on local economic growth rates in Indonesia. In particular, this is a very important topic in Indonesia considering significant variation of local development path due to economic and political decentralization.

To conduct this research, we construct a panel data set of Indonesia coastal districts' growth rates and construct a novel disaster index using economic growth data, average number of natural disasters, number of casualties, and local economic structure characteristics. The paper uses econometrics analysis to estimate the economic impact of disaster index and panel data between 2003 and 2011. As such, this research combines technical, economic, and socio-politico aspects to determine the impact of disaster on local economic growth.

Our econometric results suggest that in response to a disaster, a district's annual economic growth rate will fall. We also find that institutional factors and experience aid to mitigate the negative effect of disasters.

Keywords: Decentralisation, Economic Growth, Regional Development, Coastal Regions

Dr Azmeri

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I was born on August 20th 1973 in Banda Aceh. I am the last child of seven children from Misbach Mu'thy and Azizah Aliaman. My education history: Undergraduate level: Civil Engineering department at Syiah Kuala University (undergraduate, 1992-1997), title of thesis: Influence of Rice Fly Ash Against Concrete Compressive Strength (cement water factor: 0:45 and 0:50). Graduate level: Water Resources Management at Institute Technology Bandung (Master Programme, 2002-2004), title of thesis: Analysis of Water Supply at Srimahi Reservoir – Cimahi, and Water Resources Management at Institute Technology Bandung (Doctoral Programme, 2004-2008), title of thesis: Trade off modelling for Cascade Reservoir Operation using Genetic Algorithm. Now, I am a lecturer at Civil Engineering Department – Engineering Faculty - Syiah Kuala University. I produced some researches and publications on journals and proceedings about flash flood and erosion disaster.

Disaster risk mitigation through flash flood behaviour analysis due to the natural dam failure at Krueng Tengku Watershed - Aceh Besar Regency

Flash flood develops at space and time scales with conventional observation systems which cannot monitor rainfall, stream flow and sediment discharge. Result in a greater casualties and material losses. One of regions in Indonesia affected by the flash flood disaster was Aceh Besar Regency which is located in Teungku Krueng watershed. The flood was the recurring disasters in 1987 and 2000. The flash flood was recurring back on January 2, 2013 at 19:30 pm with greater impact. This study aims to analyse the factors affecting the danger of flash flood in the Krueng Teungku watershed and to obtain flash flood hazard zones at the watershed of Krueng Teungku. The method used in this research is the method of weighted overlay through Geographic Information System (GIS). The result of this study is expected to provide information about flash flood hazard zones at Krueng Teungku watershed as a model for early warning. The ability of flash flood forecasting which does not have a measuring tool can be improved through the development of this model. This paper contains a review of factors affecting the incidence of flash flood included factors of peak discharge, slope, watershed shape, gradient of the river, damming, density of the river, erosion, slope stability and the storage volume. Hopefully, those information factors with special emphasis on how research agencies and government (Aceh Disaster Management Agency) can contribute to guide the activities of the flash flood disaster risk reduction.

Keywords: Flash flood, natural dam, dam failure, early warning

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Mizan Bustanul Fuady Bisri (Mizan) is Researcher at Research Center for Disaster Management, Bandung Institute of Technology (ITB)-Indonesia and PhD Candidate at GSICS-Kobe University, Japan. Prior to his doctoral program, he received M.Eng in urban planning from ITB-Indonesia and M.Sc. in political science from Kobe University-Japan. His research interests range from the politics of disaster and humanitarian action, urban planning for disaster risk reduction and climate change adaptation, and community development. As a young scholar, he has published in several peer reviewed academic journals, indexed proceedings, and one book chapter which exhibit research experiences and knowledge contribution from disaster cases in Indonesia, Japan, and other countries in Southeast Asia. He has also received promising research such grant, such as from UN-OCHA's Humanitarian Research and Innovation Grant Program in 2013. In addition to his professional activities, he also involved in youth volunteerism on disaster risk reduction with Bandung Disaster Study Group (BDSG) in Indonesia, Kobe RMC in Japan, Youth Beyond Disasters, and United Nations-Major Group for Children and Youth (UN-MGCY). With involvement in DRR volunteering activities, he was selected as one of the promising Indonesian youth by the UNFPA Indonesia Office in 2015.

Assessment of Contingency Plan and Inter-Organizational Network Resilience to Respond Tsunami Early Warning System in West Sumatra Province

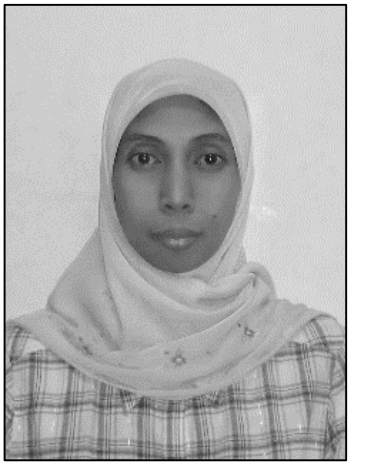
Indonesia already established end-to-end Tsunami Early Warning System (Ina-TEWS) in 2008 and by 2012 the system expanded to assume regional mandate as the Regional Tsunami Service Provider in the scheme of Indian-Ocean Tsunami Early Warning and Mitigation System (IO-TEWS). However, there is still a room for improvement; i.e. the need to install another tsunami early warning hardware to complement current Ina-TEWS for detecting near-field induced Tsunamis (NFTs), of which such technology will soon be installed for improving Ina-TEWS capability on above-mentioned matter, particularly along the coast of West Sumatra Province.

With improvement on the technological side, adjustment on the early warning, evacuation order, and emergency/crisis response Standard Operating Procedure (SOP) at local level is necessary. As part of the societal improvement, application of network theory using Social Network Analysis (SNA) is conducted in this research, i.e. to analyse the required improvement upon the instalment of new tsunami warning system to local early warning, evacuation order, and emergency response policy and real-time information flow among multi-stakeholder in emergency. Integral to this concern, empirical analysis on inter-relations and network among disaster management actors in the study area is required. As initial focus, the study scope of this research is limited to four municipalities in the coast of West Sumatra province; i.e. Agam Regency, Pesisir Selatan Regency, Padang City, and Pariaman City.

There are several objectives of this research: 1) examine the current network of inter-organizational coordination and information flow in utilizing current tsunami early warning system and emergency response Standard Operating Procedure (SOP), 2) model the networks of actual coordination, interaction, and information exchange among disaster-related actors in the study area; and 3) compare the network of organizations in early warning and emergency response stage between the one indicate by SOP document and the actual one. Specifically, the research in its first year aims to answer the following questions: 1) in what ways did multiple disaster-related actors in West Sumatra obtain, utilize, and exchange information regarding tsunami early warning? 2) What were the characteristics of the actual network of information flow and multiple actors for coordination on current TEWS? And 3) what is needed to be adjusted for future near-field tsunami early warning system instalment?

Keywords: Tsunami, Early warning system, Inter-organizational network, Social Network Analysis

Dr Irin Caisarina



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Dr. Irin Caisarina, began her academic career in Syiah Kuala University since January 2005 as a lecturer in Architecture Department at the Engineering Faculty. She graduated with a Ph.D. degree in Transportation Planning at Universiti Sains Malaysia, Master of Science (Building Technology) from the same university and Bachelor of Science (Transportation) from Syiah Kuala University, Aceh – Indonesia. Her interests are transportation planning study, transport policy and public transportation and she is actively involved in research and consultancy work related to public transportation.

Public Awareness on Evacuation Route in High Risk Coastal Community

Most areas of the city of Banda Aceh are located along the shoreline, which makes the region vulnerable to disasters. The tsunami disaster in December 2004 has resulted in tremendous damage and causing many casualties. One of the factor that causes this hazards is there is no adequate information of the types of disasters and how to respond them. Controlling natural hazards is difficult and, thus, enhancing social capacity to cope with disasters is one of the most effective ways to manage and reduce disaster risks (JICA, 2008).

Evacuation route in Banda Aceh city only have been developed after the tsunami 2004. Early observation shows that most of community do not aware about the evacuation route that has been planned by the government. It was proofed when the big earthquake struck Banda Aceh on April 2011, chaotic situation appeared in all of the city. This is due to lack of socialization of evacuation route. A Simulation and standard for evacuation ever delivered among school children in Banda Aceh city.

This research attempts to scrutiny level of public awareness on evacuation route in their area. The result could help the government, policy maker and other stake holders to plan and design an effective standard for community to be aware how to evacuate safely when hazards occur. To achieve the goal a Simultaneous dissemination of evacuation standard should be carried out to all the stage of age, especially those who are live in coastal area.

Keywords: Evacuation route, public awareness, coastal area.

Thomas Edward Cottam

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Ed Cottam has been a Graduate Tutor in Strategic Management at Newcastle Business School since 2012, and has recently submitted his PhD studying inter-firm relationships and open innovation in north east-based manufacturing SMEs. He has presented research at several national and international management events, and is a frequent writer & reviewer for the British Academy of Management.

Ed's teaching interests include international business, social entrepreneurship, innovation and knowledge management. He delivers lectures and seminars at both undergraduate and postgraduate level, in addition to supervising dissertations.

Ed also acts as technology consultant for Newcastle Business School's innovative undergraduate consultancy project, which sees final year students tackle real business problems experienced by local firms.

Social media in disaster response: What characteristics of disaster media content capture users' attention?

My main area of interest and current academic focus is on knowledge sharing, with a specific focus on how networks facilitate this process. Public responses to Hurricane Katrina in 2005, the Haitian Earthquake in 2010 and Nepal's earthquake of 2015 highlight the huge importance of social media in contemporary disaster mitigation and response.

The benefits of social media communication over more traditional media platforms, e.g. radio, TV and newspapers, in emergencies are that they are fundamentally low-cost, scalable and a relatively quick means of one-to-many communication. Furthermore, they are mobile, possess visualisation, GIS (geographic information systems) tools, and are timely and reliable. The potential for such technology is vast, as local governments and emergency services can receive specific updates regarding immediate high-risk areas, facilitating decision-making and the effective allocation of finite resources. However, there is currently a limited understanding of how disaster social media content capture users' attention, and whether those that do represent the most urgent concerns (Houston et al., 2015). Knowledge of how such content generates attention would serve to minimize preventable damage to infrastructure and loss of lives by enabling emergency services to identify high-risk areas and make resource allocation decisions more effectively.

The proposed study utilizes a Webnography research design to assess the characteristics of disaster social media content that receive the most attention. The researcher proposes a content analysis of historic disaster social media content and a review of the proliferation of such content to assess common characteristics of those that are shared most frequently. The study aims to make emergency responses to such content more efficient. Ultimately, informing disaster response training and public guidance on how to recognize and create content, which ensures a reduction in preventable losses to both people and infrastructure.

Keywords: Disaster Response, Social Media

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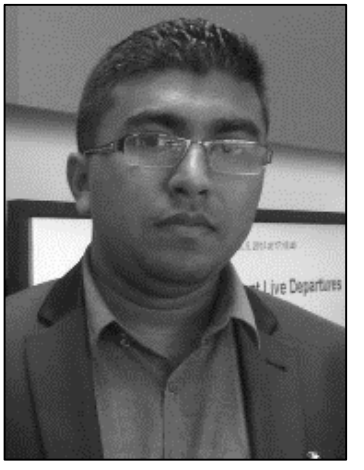
A PhD student in Disaster Management, Global Disaster Resilience Centre, University of Huddersfield, UK and a consultant (project coordinator), at IUCN in a partnership project with UNICEF, Central Environment Authority and Ministry of Urban Development and Water Supply and Drainage developing a multi sector strategy and action plan for the management and conservation "Kelani" river basin in Sri Lanka. Also a Visiting Lecturer in Masters programmes such as Disaster Management and Development Practice in Universities of Colombo and Peradeniya, Sri Lanka. Obtained Masters in Women's Studies with a special focus on Disaster Risk Reduction and B.Sc. Agriculture with a special focus on vulnerable communities. Comprised with 10 plus years of experience in the field of disaster management. Several paper publications in international journals such as Disaster Resilience in the Built Environment, Disaster Prevention and Management Journal and reviewer of International Journal of Disaster Risk Reduction. Former UNDP staff/team member in many national initiatives such as developing a five year Comprehensive Disaster Management Programme for Sri Lanka with BCPR, developing HFA monitoring reports with UNISDR, Integrated Post Flood Assessment with the World Bank and GFDRR, developing standard school books with technical agencies in Sri Lanka, Panellist-Global Risk Forum, Davos, 2012.

Gender Equity and Disaster Resilience Associated with the Third Revolution Digital Technology

Disasters are social and political events that are linked to who we are, how we live and how we structure and maintain our society. Resilience is the opposite of vulnerability that describes the capacities of societies, communities and individuals or a social-ecological system to deal with adverse consequences and the impacts of hazard events. New and innovative Emergency Communications and Warning Systems (ECWS) technologies and solutions enable improved emergency or disaster management making resilient nations. As a part of wider preparedness and mitigation strategies established after devastating Tsunami 2004 which is the largest disaster caused by a natural hazard in Sri Lanka, Disaster Management Centre (DMC) together with individual, regional and global agencies have implemented several programmes to improve the awareness of people in tsunami prone districts and established tsunami early warning mechanisms. Prominent research shows that different types of systems (e.g. decision support, resource management, early warning, communications, and inter-agency) are highly valued in emergency and disaster events reducing live losses with improved preparedness capacities. Third revolution digital technology that has semantic features such as standard protocols can facilitate standard data exchange therefore proactive decision making challenging the traditional power relations. Within this context, this paper will take an attempt to critically examine the effect of third revolution digital technology on gender equity within disaster early warning systems.

Keywords: Disaster Resilience, Gender Equity, Early Warning, Tsunami, Digital Technology

Nuwan Dias



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I am coming from an Urban Design and Urban Planning background and currently have submitted my PhD thesis to the school of Art, Design & Architecture University of Huddersfield, UK and waiting for the final evaluation. Prior to my PhD I have obtained my MSc. in Urban Design from University of Salford, UK and BSc. (Hons) in Town and Country Planning from University of Moratuwa, Sri Lanka.

Further, I am a researcher at the Global Disaster Resilience Center, University of Huddersfield, UK and have actively engaged in several EU funded projects which addressed disaster resilience and management issues in post disaster reconstruction and disaster resilience education. Prior to that I have worked as a Project Coordinator at the Faculty of Architecture, University of Moratuwa, Sri Lanka and have engaged in several projects which addressed issues related to urban planning and regeneration.

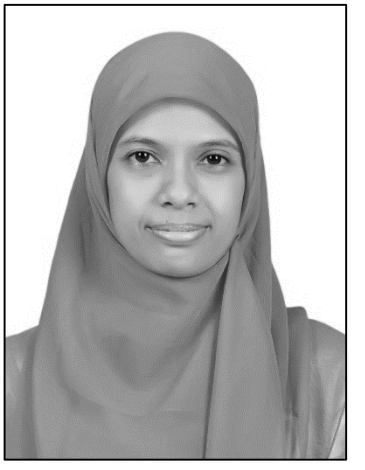
The challenges for the NGOs' in rebuilding the social values in post disaster reconstruction

Urban environments are extremely complex by its nature. An urban environment is not just a representation of a set of buildings & infrastructure. An urban environment is a spatial entity where social values, local cultures, relationships are maintained in a built and natural environment combined with inhabitant's economic choices. Accordingly, post disaster reconstruction becomes far more than building houses and roads as it should rebuild the social values, cultures and the relationships of the people. Understanding these complex social factors become extremely difficult in post disaster reconstruction as the normal physical and social setting have been widely disrupted by the disaster incident, further the community themselves are undergoing with an extreme situation where their psychological heath can be extremely worst. Beyond all these obstacles NGOs' themselves are strangers to the affected urban environment in many post disaster reconstruction projects where understanding these complex social facts become far more difficult. Many post disaster reconstruction projects have had less success as the project partners could not re-establish these broken social values. Therefore, understanding & re-establishing these social factors in post disaster reconstruction has become a challenge. Accordingly a study has been conducted to understand these challenges and it was revealed, ability to deal with the emotional and psychological well-being of victims, understand the local culture, reaching the community due to language barrier, understand the exact needs of the marginalized community, ensuring the continuous maintenance of their livelihood, reconnecting neighbourhoods, selecting suitable housing location and design, representing the identities of the local context are the key challenges for the NGOs' in rebuilding the social values in post disaster reconstruction.

CADRE research project has been funded with support from the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use, which may be made of the information contained therein.

Keywords: Complex urban environments, Challenges, Socio factors, Post disaster reconstruction

Sri Aliah Ekawati



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Sri Aliah Ekawati. I finished my study in Department of Architecture, Indonesia Islamic University on 2007. From 2008 until 2011, I was a master student at Urban Design Program in Bandung Institute of Technology. Currently, I am a lecturer at Urban and Regional Planning, Department of Architecture, Hasanuddin University, Makassar. I have contributed to teaching at undergraduate levels since 2013. I teach Community Planning and Development, and also Waterfront Planning and Development.

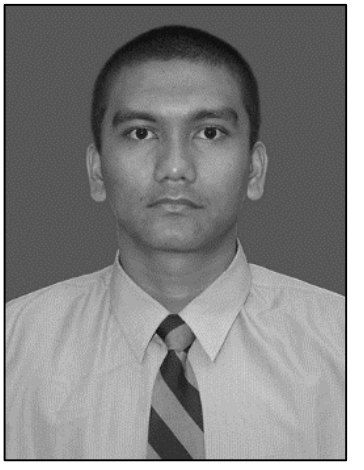
Joining the Lab. Waterfront in Urban and Regional Planning, Department of Architecture, Hasanuddin University gives me the opportunity to elicit my knowledge in urban design and planning particularly in waterfront city planning. Study related to waterfront plan and design is my focus. In addition, I also interest with issue about community participation, disaster impacts to the city, and children-friendly city. Currently, I am making efforts to widen my knowledge how economy, social, and spatial planning are influenced each other.

Facing the Sea Level Rise: Adaptation Concept into Waterfront City Planning in Makassar

Mitigation planning especially for coastal area is necessary. This study aims to find the appropriate formulate in order to reduce the sea level rise impacts in Kelurahan Tallo, Makassar City, Indonesia. Several methods are used to reach the objective of the study. Reviewing literature related to sea level rise and adaptation planning is the important requirement in this study. Observing and interviewing communities are also conducted to get the valid data. Furthermore, all of data was analysed to identify the vulnerability and adaptive capacity score. These results are used to formulating adaptation concept to face the sea level rise. This study finds that the built environment is the high sensitive assets. To reduce the vulnerability, researches use three approaches such as protecting, accommodating and relocating. Finally, the development plan resulted is not only solve the sea level rise problems, but also provide tourism activities which can increase community's social and economy lives.

Keywords: Waterfront city, sea level rise, mitigation planning, Makassar

Fahmi



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Fahmi is currently work at local agency planning, Aceh Besar regency, Province of Aceh, Indonesia as “sub-Division Chief of Program, Research and Public policy”. He finished his bachelor degree in Civil Engineering with “distinction predicate” at the University of Syiah Kuala (2004). Two years later, he continued to pursue his master degree at Universiti Teknologi Malaysia and he passed with Good Pass (2008). In 2010, He got a chance to pursue his doctoral degree program at Dynamic Spatial Modelling group, Institute for Transport Studies, University of Leeds, UK. His research area is related to the issue of Integrating Disaster Mitigation Strategies into Land Use and Transport Plan Interaction. He expect that the planning concept developed in this research could help the high-risk cities (i.e. several areas of the city are located in disaster prone areas) to reformulate their land use and transport strategies in the framework of sustainable development.

Besides that, related his research, he is also particularly interested in using several specific softwares e.g. dynamic modelling softwares such as VENSIM and ArcGIS or Google Earth, which can be used to visualize the modelling results in a more attractive way to be shown to stakeholders in easy way. Regarding his current Job, Fahmi is also actively contribute to promote the issue of sustainable development through several government program in Aceh.

Implementation of Land Use and Transport Plan (LUTI) in the framework of disaster mitigation strategy for planning city more resilience

The high-risk cities worldwide in disaster prone area face the problems regarding the increase of vulnerability to natural disaster and urban-transport problems. Unfortunately, there has been no study that specifically concern in these two issues simultaneously regarding how these cities should define their sustainability concept and formulate their land use and transport strategies in the framework of sustainable development. In other words, the sustainability concept in the framework of urban risk reduction and urban transport sustainability have not been discussed in an integrated way. Consequently, strategies proposed in these two different areas work in isolated way in achieving their-self objectives, which are separately implemented. This research aims to address this gap. Therefore, this study presents an approach of integrating concept of disaster mitigation strategies into the land-use transport plan interaction (LUTI) by combining the disaster mitigation with conventional land use and transport strategies in the framework of urban risk reduction and urban transport sustainability. It is expected that the application of several policy measures in the combined framework of urban risk reduction and urban transport sustainability could be applied in order to reach the city objectives in the framework of urban risk reduction and urban transport sustainability in order to plan the city to be more resilient.

Keywords: High-risk cities, sustainable development, city resilient, LUTI Plan

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Dr Viachaslau Filimonau is a Lecturer in Hospitality Management in Faculty of Management at Bournemouth University. He has background in Geography and Geo-ecology (BSc), Environmental Management and Policy and Applied Environmental Geo-science (MSc) and Tourism Management (PhD). His research interests include sustainable mobilities; environmental management in tourism and hospitality; water resources and carbon footprint management in tourism; and assessment of tourism's impacts. Viachaslau has been doing research on these topics in a variety of geographical contexts, including Poland, Sweden, Germany, Brazil and the UK.

The role of sustainable tourism in enhancing disaster preparedness and supporting recovery of coastal destinations

Tourism brings a significant number of benefits to destinations and many communities across the world rely on the tourism industry as the primary source of income. Tourism plays particularly important role in coastal destinations as traditional 'beach and sun' holidays remain to be popular, especially in developing countries. Man-made and natural disasters have a detrimental impact on tourism; they also make a severe effect on communities that depend on the industry, especially in terms of livelihood recovery and fall in tourist numbers. Tourism's role in disaster relief and destination recovery is controversial. While the industry can draw international attention to the damage caused by disasters, thus attracting more support, post-disaster tourism development at a destination designed to compensate for the losses inflicted may further intensify the problems caused by disasters which hampers rapid recovery of local communities. It is therefore argued that communities should look into an opportunity of developing sustainable tourism at a destination as it provides a number of substantial resources that can be capitalised upon to enhance community's preparedness for disasters and facilitate relief. This study aims to analyse the role of sustainable tourism in building disaster-resilient communities and supporting recovery of destinations, with a focus on coastal communities. It strives to identify 'good business' practices adopted by tourism companies and destinations globally which can be utilised for disaster management in coastal communities. The study sets out to understand what approach the tourism industry and its particular stakeholders should implement in order to successfully re-develop destinations after a disaster. This is to ensure tourist safety and local community support, thus facilitating long-term benefits and enabling the progress of coastal destinations towards the goal of sustainability.

Keywords: Tourism, disaster management, coastal communities, destination management, sustainability

Agus Halim

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I was born in small city namely Langsa, East Aceh District on August 8, 1959. I am the seventh child in my family. I grew up in Banda Aceh (the capital city of Aceh Province) and finalized senior high school at SMA Negeri 1. After that I studied continued at Bogor Agricultural University (IPB) in 1979 and took the Study Program Water Resource Management at Fisheries Faculty. After graduating from IPB, I had taken a long time experience with the Environmental Research Center of Syiah Kuala University. Next after one year at Bapedalda of Aceh Province as a specialist staff, I did at Management Board of Free Trade and Free Port Sabang (BPKS) as the head of Fisheries Division. After tsunami disaster I worked for BRR NAD-Nias as Director to handle Environment Directorate from 2005-2006 and Marine & Fisheries Directorate from 2006-2007. Furthermore I also worked for the United Nations of Food and Agriculture Organization (UN FAO) for three years as a National Fishery Deputy Project Manager to implement Sustainable Fisheries Development. After UN FAO's Office close in Banda Aceh, I worked for Leuser International Foundation as Project Leader of AFEP (Aceh Forest and Environment Program) supported by Multi Donor Fund (MDF) and controlled by the World Bank and after that continuing as Person in Charge of Leuser International Foundation. Finally I worked for Project Implementation Unit (PIU) for Scientific Studies of Tripa Peat Swamp Forest collaboration between Syiah Kuala University and UNDP, under the UKP4/Satgas REDD+ monitoring.

Agriculture and Aquaculture Rehabilitation in Post-tsunami Aceh, Indonesia

The earthquake 9.2 Scale Richter on December 26, 2004 generated the tsunami wave hit the coastal area of Aceh Province. It caused the serious damage such as housing and sanitation facility; road and bright facilities; the weakness of local institution capacity; health facilities; and the stagnation of economic sector, including the business of rice field and aquaculture or "tambak".

This research was conducted to see about the impact of tsunami on agriculture and aquaculture aspect, focus on Banda Aceh City, Aceh Besar, and Aceh Jaya Distract. The goal is to know (1) the damage level of brackhiswater ponds and rice field farming; (2) the successful of rehabilitation and reconstruction process; and (3) some lesson learnt how to make become better.

The tsunami wave caused seriously damaged for rice field at the coastal area usually located at Aceh Besar District. All rice field covered by sediment from ocean and debris of housing so its soil quality had been changed, become saline. There were 6 institutions/donors working for rice field rehabilitation and generally they worked successful (66.7%) especially done by USAID, ADB, UNDP, and Mammamia; the failed only 33.3% including BRR NAD-Nias.

The wave tsunami caused also seriously damage for aquaculture facilities like tambak and its irrigation. Base on GIS analysis on 8 villages (Deah Baro, Alue Deah Teungoh, Lamjabat, Lampulo, Lambaro Skep, Lamdingin, Rukoh, and Tibang) in Banda Aceh City from the total area of tambak 367.6 Ha, there were 83,9% heavy damaged; 8,6% middle damaged; and 7,0% slightly damaged. The rehabilitation was not only to recover its construction become functional again, but also the process itself contributing to prepare accidental job for community income through cash for work (IDR 35,000/person/day). The cash for work could stimulated the rapid recovery of coastal community life. The functional tambak will become the important think supporting the economic local community growth. From 7 institutions/donors involving in the tambak rehabilitation Elaska, ADB, BRR NAD-Nias, NGOs, Japanese NGO, Oxfam, and USAID), BRR NAD-Nias did by involving local community directly in group. From 5 of them who worked successful for tambak rehabilitation in Banda Aceh City, BRR NAD-Nias looked more successful than others (Elaska, ADB, NGOs, and Oxfam) although it worked for 18 districts/cities, by using "swakelola project" approach.

It can be taken some lesson learn how to implement the program become successful, such as (1) a good assessment before designing the program; (2) close participation with local community; (3) close collaboration among donors; and (3) a good economic species selection adapted with environmental change.

Key words: Agriculture; Aquaculture; Rehabilitation and Reconstruction; and Tsunami Disaster

Dr Ezri Hayat

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Ezri is a Post-Doctoral Research fellow in the Global Disaster Resilience Centre, University of Huddersfield, UK. He finished his PhD in Disaster Management and Infrastructure Reconstruction at the University of Salford in 2015, under the supervision of Professor Dilanthi Amaratunga and Professor Richard Haigh.

His thesis, entitled as 'Evaluation of the Local Government Capacity in the Maintenance of Post-disaster Road Reconstruction Assets", highlights the need to maximise the value of investment made in the reconstruction of road infrastructure sector in a post-disaster context through evaluating the local governments maintenance capacity. He also holds a master degree in Construction Management from the University of New South Wales, Australia, and a Bachelor degree in Civil Engineering from Trisakti University, Indonesia.

Ezri's research interests include disaster management, infrastructure reconstruction and international development. He seeks the opportunity to have a joint collaboration with other researchers and professional from both the academia and the industry.

Prior to his academic career, Ezri spent his professional time working with various international companies and donor organisation including GTZ, GHD, and UN HABITAT in a number of post-disaster reconstruction project in Aceh and West Sumatra, Indonesia. Ezri is also an incorporate member of the Chartered Institute of Building (CIOB).

Evaluation of Local Governments Capacity in the Maintenance of Post-Disaster Road Reconstruction Assets

Road infrastructures play an important role in the economic improvement of the community in the surrounding area. Road transport disruptions are also suggested as the critical constraints to providing effective and efficient responses in an emergency, which may result in high transport costs and procurement lead times.

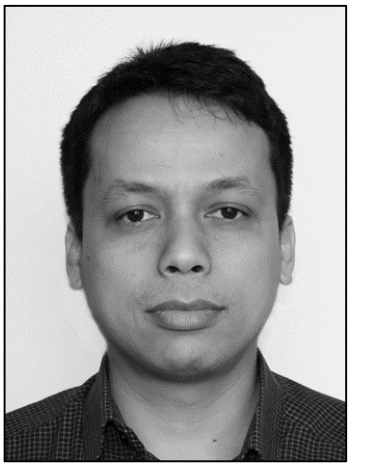
As road infrastructure is amongst the top priority in a post-disaster recovery and require a significant value of investment, the study evaluates the capacity of the local government in maintaining the road reconstruction assets.

Three districts in Aceh were included as the case studies. Semi-structured interviews were conducted with high-level officials, policy makers, and the stakeholders of post-disaster road infrastructure reconstruction at the national, provincial, and the local level as the primary data collection methods.

The findings suggest that the road infrastructure was generally neglected from maintenance. The local governments of the case studies lacked the preventive maintenance culture, and their general responses to preserve the road infrastructure were to postpone the maintenance need by using the more expensive high standard pavement types (HMA) and to repair the roads when they have broken. This condition was affected by a number of internal and external factors. The local political condition, the socio-economic condition, the conflict of authorities between government agencies involved in road maintenance, and the poor financial capacity of the districts, were exacerbated by the poor capacity of the road authorities' personnel. A framework for the reconstruction and maintenance of road infrastructure assets was also suggested indicating the different phases of road infrastructure life cycle in a post-disaster context.

Keywords: post-disaster, infrastructure reconstruction, local government, road maintenance

Dr Benny Hidayat



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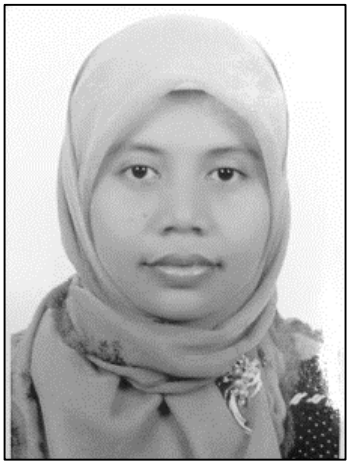
Benny graduated from civil engineering department of Institute of Technology Bandung (ITB) with bachelor degree (sarjana teknik, ST) in 1998. Then Benny continued his study at the same university for master degree (magister teknik, MT) in construction management in 1999. He started his academia career in 2000 as lecturer in Civil Engineering department of Andalas University in Padang, West Sumatra, Indonesia. He has been involved in teaching, research and supervising student in construction management topic area. In 2009 he received Dikti (Higher education directorate) scholarship to pursue PhD study at Salford University in Manchester UK. After finished his PhD in late 2013, Benny continues his work as lecturer at Andalas University.

Knowledge Transfer to Builders in Post-disaster Housing Reconstruction in West-Sumatra of Indonesia

Housing is the most affected sector by disasters as can be observed after 2009 earthquake in West Sumatra province in Indonesia. As in Indonesian construction industry, the housing post-disaster reconstruction is influenced by knowledge and skills of builders or locally known as 'tukang'. There were trainings to transfer knowledge about earthquake-safe house structure for them in the reconstruction. The study examined the effectiveness of the training in term of understanding of the builders and application of the new knowledge. Ten semi-structured interviews with the builders were conducted in this study. The results indicate that the builders with prior housing construction experience can absorb and understand the new knowledge about earthquake-safe house structure. Combination of lecture and practice sessions also helps the builders to understand the knowledge. However, findings of this research also suggest there is a problem in implementation of the new knowledge. Utilisation of earthquake-safe house structure leads to a rise in house cost. Therefore, some house owners prefer to save money than to adopt the new knowledge.

Keywords: disaster, knowledge transfer, reconstruction

Yunita Idris



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Ms. Yunita Idris is a junior lecturer for Civil Engineering Department, Engineering Faculty, Syiah Kuala University. She received her bachelor degree from Syiah Kuala University in 2003. After that, she spent about two years working as the junior structural engineer at one of the local consultant in Aceh. She received her master of structural engineering from The University of Melbourne in 2008, before she joined Syiah Kuala University as an academic staff. Currently, she is doing her research on the structural behaviour of high performance fibre reinforced polymer (FRP) – concrete – steel composite members as part of her PhD program in The University of Adelaide. Her research interest are the seismic behaviour of structural building, rehabilitation of structural building, building resilience and durability assessment of building.

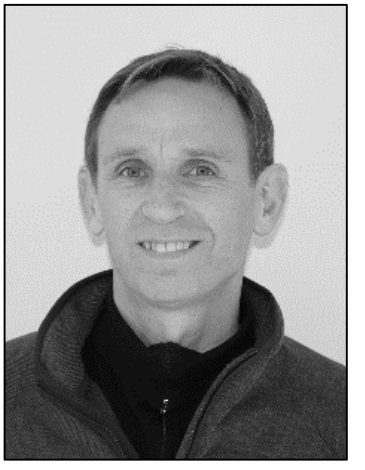
Reviewing the Potential Seismic Retrofit Design of Reinforced Concrete Columns in Aceh

Indonesia, especially Aceh, was located in the high hazard seismic area. Aceh had experienced the high magnitude of earthquake in 2004 with the huge number of death tolls. Although the death tolls was mainly the impact of tsunami, but a number of buildings was recorded collapsed due to the impact of the earthquake. The collapsed was mainly due to the failure of the building columns. The least acceptable of column failure was the sudden failure, which is the typical of concrete failure. To avoid the sudden failure of columns was to increase the ductility of columns. Ductility is the capacity of columns to displace beyond its elastic limit. High column ductility had early warning of structural failure before completely collapsed.

Up to date, researchers had proposed some methods of column retrofit. A number of methods that had been proposed by previous researchers involving the confinement methods by using some materials e.g. concrete mortars, steel, and recently fibre composites. This research focused on analysing and reviewing the potential seismic retrofit design for column buildings in Aceh. The parameters will include the availability of materials, the reliable application of those methods for buildings in Aceh. The results of this observation will be listed and discussed to come up with the potential seismic retrofit design for Aceh buildings.

Keywords: Building resilience, Seismic retrofit, Reinforced Concrete, Columns, Composite.

Dr Noel Johnson



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After a twenty-year career in the UK Fire Service, I began my journey into academia with a BA and MSc in Disaster Management at Coventry University, and continued to complete a PhD at University of Liverpool. My research focuses mainly upon two overlapping areas - social capital and organisational resilience. I have a particular interest in the resilience and adaptive capacity of small and medium sized businesses and networks.

At the University of Liverpool, I was a co-researcher on a three-year project concerned with identifying better practices in business continuity practice. The project included the participation of public, private and voluntary sector organisations including Gloucestershire County Council, Ministry of Justice, Highways Agency, BP, Sainsbury, Royal Bank of Scotland, PricewaterhouseCoopers, Thames Water, Network Rail, and The National Trust.

I am currently a researcher on the SESAME project 'Organisational operational response and strategic decision making and long-term flood preparedness in urban areas', which is a three-year project that started in December 2012 and is EPSRC funded (£1.05m). This is an inter-disciplinary project combining expertise from computing and hydrological engineering, economics, management and the behavioural sciences with collaborators from the universities of Durham, Leeds, Kingston and the West of England. http://sesame.uk.com/index.php

Organisational operational response and strategic decision making and long-term flood preparedness in urban areas

The flooding of an organisation's premises causes loss, disruption and distress for staff, clients and owners and also impacts upon the wider economy. To reduce these negative effects, organisations in at-risk areas need to learn how to prepare for such events. Currently, businesses and not-for-profit groups rarely have formal plans in place for ensuring the continuity of their activities. This project conducts empirical research into the behaviours of organisations, models their interactions with other organisations such as customers/suppliers, emergency responders, and insurers. Drawing on the multidisciplinary skills of researchers (engineering, hydrology, economics, business and the behavioural/social sciences), this research has four main objectives:

(1) Establish how agent based modelling and simulation can provide information that can be used to improve organisational business continuity - i.e. by modelling a) the attributes, actions, interactions and the dynamic behaviours of different types of at-risk UK organisations; and b) the consequences of these for responses to flooding and longer-term preparedness.

(2) Develop and test a digital communication tool that will provide organisations practical information in a format that engages users in a tailored and active learning process.

(3) Achieve a better understanding of business continuity processes and how private and public sector organisations behave and interact with each other, and with communities, in the immediate and longer term aftermath of flood events.

(4) Assess the impacts of flooding on economic systems within and beyond the immediately affected urban area and explore how changed behaviours could influence these impacts.

Keywords: Floods, Resilience, Social Capital, Adaptive Capacity, Small Businesses

Dr Anastasia Koulouri

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Anastasia Koulouri is a Lecturer in Business Research and Statistics at Dundee Business School, Abertay University (Dundee, UK). She graduated from the University of Strathclyde with a BSc in Mathematics and a PhD in Management Science. Anastasia started her career in the academic world with research positions at the University of Strathclyde (Glasgow, UK), the Technical University of Helsinki (Helsinki, Finland), and the Belgian Nuclear Energy Research Centre (Mol, Belgium). She then worked for 8 years in the areas of criminal justice and law enforcement as the Research and Training Manager for the Risk Management Authority (Glasgow, UK), and as Senior Intelligence Analyst and Deputy Principal Analyst for Police Scotland (Glasgow, UK). Her main research interests are in decision analysis and management science and in particular the application of Multi-Criteria Decision Analysis methodologies in vulnerability/risk assessment, police resource allocation, and social enterprise and regional development.

Multi-Criteria Decision Analysis in Coastal Vulnerability Assessment

In recent decades, coastal hazards have led to a number of disastrous incidents which resulted in loss of life and impacted on the socio-economic health of the affected communities. Research shows that inadequate assessment of the vulnerability of communities, and inappropriate preparation to respond to such events has negatively affected those communities' resilience to them. Assessing the vulnerability of critical coastal infrastructures and prioritising their protection is one of the ways to address these challenges.

The purpose of this paper is to review the literature on methods for assessing and prioritising vulnerable infrastructure locations in coastal communities. It applies a novel assessment approach to coastal communities in Scotland and identifies challenges and benefits associated with its use in the Scottish context. It finally explores the potential of applying this approach to the Indonesian context.

The paper's methodology draws on a study by Johnston et al (2014)[1] who propose a methodology using a multi criteria decision analysis matrix to assess the vulnerability of coastal infrastructure, and to prioritise and target interventions to improve the resilience of vulnerable locations according to an overall importance score. Johnston et al (ibid) argue that its use contributes to the engagement of key stakeholders leading to increased awareness and improved understanding of the risks and vulnerabilities of communities, and enables better targeting of resources and improved preparedness. They further argue that the proposed approach uses limited information whilst taking into consideration "hard to quantify" socio-economic, environmental and health consequences of coastal flooding. Although the approach has been successfully applied in USA, this paper argues that it is transferable to other communities.

Preliminary results are expected in the area of methodological advancement to enhance the assessment of the vulnerability of critical infrastructures to coastal hazards drawing on concepts from multi-criteria decision analysis. Key stakeholders might benefit from this approach in infrastructure planning and budget targeting.

[1] Johnston, A., Slovinski, P. & Yates, K.L. (2014). Assessing the vulnerability of coastal infrastructure to sea level rise using multi-criteria analysis in Scarborough, Main (USA). Ocean and Coastal Management 95:176-188

Keywords: Multi-Criteria Decision Analysis, vulnerability assessment, coastal hazards

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Champika is currently working as a Senior lecturer in the School of Engineering, University of Central Lancashire, Preston, UK. She has a PhD in Facilities Management from Glasgow Caledonian University, UK. Champika is engaged in carrying out research activities in the areas of Sustainable Construction, Healthcare Facilities Management, Infrastructure Management and Public Private Partnerships. She has secured many grants, especially EU grants, over the past few years. For examples, European Cooperation in Science and Technology (EU COST) Networking Grant on 'Public Private Partnerships in EU Transport: Trends and Theory (P3T3)' – Ref. TU1001; FP7 EU-South Asian collaborative project on 'Collaborative Action towards Societal Challenges through Awareness, Development, and Education' (CASCADE - Contract Number: 609562); Horizon 2020 project on 'Business Models for Enhancing Funding and Enabling Financing for Infrastructure in Transport' (BENEFIT - Grant Agreement No. 635973); and Erasmus+ project on 'Advancing Skill Creation to Enhance Transformation' (ASCENT – grant agreement is being prepared); and an Knowledge Transfer project on 'Indoor Air Quality, Dampness and Mould Growth in Renovated Properties in Northwest England'. Champika has published over 100 peer-reviewed journal and conferences papers to-date. She has also won several awards for her research and publications.

An Investigation into the Applicability of a Public Private Partnership model for Delivering physical infrastructure for disaster resilience

Public Private Partnerships (PPPs) can help to alleviate chronic underinvestment in capital-intensive projects and can also serve as a vehicle for the injection of private sector financing while allowing government to maintain their fiscal targets and avoid taking additional debt. PPP seeks to reduce the amount of public money usually tied up in capital investment under traditional procurement as it relieves government of a substantial proportion of public debt (Akintoye et al., 2005). However, PPPs may suit certain scenarios and some projects therein, but not all. Depending on the strengths and weaknesses of the public and private sectors in a country or region, PPPs may be chosen to combine their resources for delivering public infrastructure and services, albeit in certain projects only. Similarly in disaster resilience management, some projects may be best left to the public sector, e.g. social services, while some others may be seen to benefit from both public and private sector inputs in the rebuilding or even in the new development and sustenance of certain types of physical infrastructure, for example in utilities such as power, water and communication infrastructure and in health and education services. Therefore, it is imperative to understand to what extent the mode of PPP is suitable and applicable in the context of building physical infrastructures for disaster resilience and management.

Keywords: Infrastructure; Private sector; Project Delivery; Public Private Partnerships

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Chamindi is a research assistant attached to the Global Disaster Resilience Centre, University of Huddersfield. She has joined University of Huddersfield in December 2014 and currently working as the lead researcher of EU funded CADRE (Collaborative Action towards Disaster Resilience Education) research project which aims to address current and emerging labour market demands in the construction industry to increase societal resilience to disasters. Immediately prior to the appointment at the University of Huddersfield, she was working as a research assistant at the School of the Built Environment, University of Salford. While working at the University of Salford, she was able to contribute to number of EU funded research projects, some of which include, RESINT (Collaborative reformation of curricula on resilience management with intelligent systems in open source and augmented reality); CENEAST (Reformation of the Curricula on Built Environment in the Eastern Neighbouring Area); BELLCURVE (Built Environment Lifelong Learning Challenging University Responses to Vocational Education); and ANDROID (Academic Network for Disaster Resilience to Optimise educational Development).

She has successfully completed her PhD in 2014 in the theme of empowering local government in making cities resilient to disasters, at the University of Salford and has 6 years of research experience.

Before moving to the academic sector, she worked as a quantity surveyor for over 3 years in United Arab Emirates and Sri Lanka after gaining her first degree in quantity surveying with a First Class Honours pass. She is an author of 25 publications, which includes, book chapters, refereed journal and conference papers and various high impact reports.

Empowering local governments in making cities more resilient to disasters

Cities are growing very rapidly all over the world, particularly in developing countries. Recent high impact disasters demonstrated the vulnerability of cities to extreme natural and man-made hazards. It is therefore increasingly recognised that cities need to be developed with an effective degree of resilience so that it can prepare, adapt, withstand and recover from possible impacts of disasters. This requires that a serious effort be made by various stakeholders including, local governments, the private and corporate sector, the national government, community and community based organisations, non-governmental organisations, external actors, professional groups and the media. As local governments are responsible for local area development they have a key role to play in achieving resilience in the cities under their jurisdiction. In this context, the research aims to explore the key challenges faced by the local governments in making their city resilient to disasters and to propose the ways in which to overcome such challenges.

The research adopts case studies as its research strategy and investigates three cities in Sri Lanka which are potentially vulnerable to disasters. A number of expert interviews have also been conducted to supplement the case study findings. Empirical evidence reveals that local governments are facing a number of challenges in their contribution to making the cities resilient to disasters. Some of the issues that have emerged are; lack of knowledge of disaster risk reduction initiatives; lack of interest and political will; human resource constraints; lack of financial capability; internal organisational and administrative weaknesses; lack of community engagement; managing a long term process; lack of focus and reactive approach to DRR; inadequate urban planning; lack of tools and techniques for DRR; lack of monitoring and supervision of new developments; competing priorities; capture of local level responsibilities by the central government; lack of authority; multi-layered governance arrangements; unstable political systems; and relationship issues with central government. The study proposes a number of recommendations for overcoming these challenges and presents a framework to empower the local government to lead the endeavours to build disaster resilient cities.

Keywords: Urban resilience; disaster risk reduction; local governments; empowerment; built environment

Aria Mariany

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Aria Mariany is a PhD candidate in urban and regional planning, Institut Teknologi Bandung (ITB) and a researcher in Research Center for Disaster Mitigation ITB. She has completed her bachelor degree in Urban and Regional Planning ITB in 2002 with the title of final project is community-based flood disaster mitigation in Bandung City. Master degree in Development Study ITB was completed in 2008. Her thesis is the identification of factors that influence community in decision making to build earthquake resistant house using dynamic system modelling. She has experienced in disaster-related research since 2001, and mostly she focused on the community-based disaster management, disaster risk analysis, and integrated the disaster management with urban planning and management. During her research, she found that at local level, community has capacity to assess their own disaster risk, but she believes that there is less researches that raise the community knowledge issue to be integrated into the disaster risk analysis model. Therefore, she is willing to conduct further research in the community related to disaster risk analysis issue and uses this issue as her dissertation topic. The paper that will be presented in this workshop is a part of her research as a PhD student.

How should community involve in Disaster Risk Analysis? Mapping community involvement in disaster risk analysis

Community awareness on disaster risk in their area is an entrance for community resilience. Community know their area better. What hazard that threat them frequently, how the physical, social, and economical situation in such hazard-threaten area. They also have knowledge and capacity on how to deal with such hazard. Some social researchers has been trying to use such knowledge in disaster risk assessment by involving the community. Some methods were used to conduct the community-based disaster risk assessment. By drawing upon literatures in community-based disaster risk assessment, this paper is trying to identify the community involvement in disaster risk assessment that has been conducted or researched by several researchers and mapping them.

Keywords: Community, community involvement, disaster risk, risk analysis

Dr David McGovern

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I have graduated with a BSc in Environmental Science from Lancaster University in 2006, and gained my PhD in Geography at the same institution in 2011. I then worked as a PDRF at the National University of Singapore for 2.5 years researching the dynamics of sea ice in waves. Since June 2014, I have worked as a PDRA at UCL in the EPICentre Research Group on the URBANwaves project looking at tsunami interactions with coastlines. My main area of expertise is in physical hydraulic modelling and I have spent my entire working life so far in this field.

Physical Modelling of Tsunami Interaction with Coastal Structures

Tsunami are a significant natural hazard in coastal regions adjacent to tsunami-genic fault zones. Recent devastating examples include the 2004 Indian Ocean Earthquake and Tsunami and the 2011 Tohoku Earthquake and Tsunami.

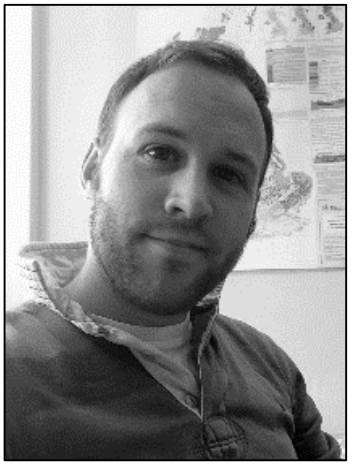
Several projects within the EPICentre research group in the Dept. Civil, Environmental and Geomatic Engineering at UCL focus on the physical modelling of tsunami and their interaction with coastlines, sea defences and buildings. This involves using a unique pneumatic tsunami generator based in a 100 m long wave flume at HR Wallingford, Oxford. The generator can produce very long period waveforms, including Froude scaled Japan 2011 and Indian Ocean 2004 tsunami traces as taken form field data. Using this facility very long period waves characteristic of tsunami can be generated and analysed.

At the far end of the flume these test waves inundate onto a constructed bathymetry and beach. A range of interactions of the tsunami with buildings, coastal defences and shorelines are investigated. These include evaluations of the force and pressure from tsunami against instrumented coastal defences and buildings, as well as understanding how tsunami behave as they inundate coastal regions. Extracting detailed parameters such as run-up on smooth and roughened beaches, inundation height and shoaling characteristics are also a key goal. Further, the analysis of the offshore behaviour of tsunami is made in an effort to understand its physical characteristics and propagation theory better. The aim is to improve understanding, risk assessment and mitigation, engineering design codes, publications and ultimately save lives and property.

Specifically to this workshop, there is an interest on how academics effectively disseminate knowledge (engineering knowledge and solutions) to the end-user (local coastal communities/planners /central governments) in a timely fashion. In particular, the publication of codes can take years, by which time many constructions may have been built without essential and new knowledge taken into account.

Keywords: Tsunami, Coastal Structures

Dr Andrew Merritt



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Dr Merritt is the Lecturer of Engineering Geology within the Centre for Research in Earth Sciences, Plymouth University, a post he has held since 2013. Andrew's research focus centres on coastal and inland landslide mechanics and their long-term monitoring.

During his PhD, he worked very closely with the British Geological Survey (BGS) in the development of a geophysical monitoring methodology for complex landslide systems. His research also advanced the field of hillslope site investigation and characterisation via the implementation of four-dimensional geophysical monitoring techniques.

The products of previous research have made him an experienced field-engineering geologist specializing in slope stability analysis, remote sensing for hillslope geomorphology and rainfall-induced landslide monitoring.

Dr Merritt's current research interests include:

[1] Geophysical monitoring of landslide activation mechanics, their integration with landslide risk assessment and the development of landslide forecasting.

[2] Coastal geomorphological appraisal of the efficacy of coastal erosion mitigation measures along Europe's fastest eroding coastline, Yorkshire's Holderness Coast.

[3] Laboratory-based assessment geomechanical behaviour of landslide-prone formations during shear using geoelectrical monitoring methods.

Andrew is a committee member of South-West Regional Group of Geology Society of London in October 2015.

Long-term Geophysical Monitoring of Hillslopes; improving the resilience of vital infrastructure and lifelines

Ground responses due to a less harmonious climate are numerous and impact on both existing structures and future design of engineering structures. For example, increased rainfall amounts and intensities will strongly affect groundwater levels which will in turn affect stability of coastal and inland slopes. Moreover, climate change processes are expected to lead to an increased incidence of both coastal and inland landslide events.

If the resilience of communities to landsliding is to be improved, and their physical effects are to be mitigated, or preferably, avoided, then the causes of landslide activations – and re-activations – must be better understood. The most common subsurface property change in the lead up to rainfall-triggered landslide activation is the moisture content of slope material and associated pore water pressure rises and/or consistency changes. If these characteristic subsurface physical properties can be observed in advance of activation then early warning of imminent slope activation may be possible. Recent advances in geoelectrical monitoring techniques reveal that time-lapse electrical resistivity tomography (ERT) is a useful tool, capable of observing hillslope hydrogeological processes. However, most previous studies lasted a short time-frame and compared few tomograms. Therefore, a geophysical imaging system in which the progressive wetting of the ground in response to rainfall leading to saturation and then sliding would seem to be a sensible approach to explore the forecasting of imminent landslide movement.

Presented here is an introduction to the field of geophysical monitoring of slopes, with particular emphasis on improving resilience of vital infrastructure. In addition, the capability of the technique is reviewed by assessing the results of a four and a half year, long-term monitoring campaign of a periodically active landslide, located in the UK, by a geoelectrical monitoring system called Automated time-Lapse Electrical Resistivity Tomography (ALERT) and developed by the British Geological Survey (BGS).

Andrew Merritt(1), William Murphy(2), Jonathan Chambers(3), Paul Wilkinson(3), Jared West(2), and Sebastian Uhlemann(3);

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Dr Lucy Montague

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Lucy joined the University of Huddersfield in 2014 as a Senior Lecturer in Urban Design. Prior to this she was a Teaching Fellow in Urban Design at The Bartlett School of Planning, University College London.

In 2013 she completed her PhD at Edinburgh College of Art, The University of Edinburgh, entitled 'Designing the Urban: Reflections on the role of theory in the individual design process', examined by Prof. John Punter. She also holds an MSc in Urban Design with Distinction, a Diploma in Architecture and Urban Design with Distinction (ARB Part II) and a BArch (Hons) 1st Class (ARB Part I) from the same institution.

Lucy has worked for architectural and urban design firms in London and Melbourne, on a wide variety of projects in terms of scale and covering retail, residential, regeneration and master planning. Her current research projects include a book, to be published by Routledge in 2017, about how urban design concepts are represented and communicated in drawings and models, co-authored with Dr Mike Biddulph; and a chapter exploring the concept of placelessness from a design theory perspective, for a publication organised by The University of New South Wales, Sydney and published by Routledge in 2016.

Designing the urban

Dr Montague's research engages with the field of urban design and focusses primarily on the relationship between theory and praxis in the built environment, the creative process and research by design methodologies. Her major interest is in the process of design and how a variety of complex and competing interests influence decision-making.

In terms of disaster resilience this suggests an opportunity to consider the ways in which extreme constraints related to environmental and human hazards can be judged against one other in order to determine the optimum arrangement of built form and open space. It also raises questions regarding the extent to which urban design theory, as a body of knowledge, currently supports urban design practice in this context.

Keywords: Design; urban; theory

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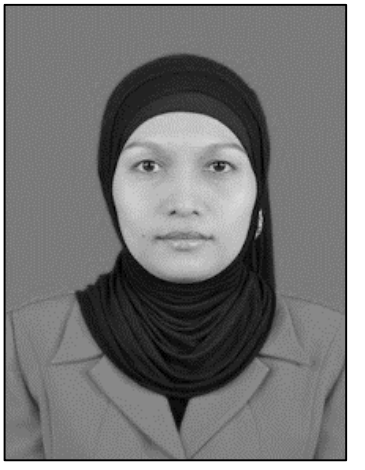
Nikolai Mouraviev has earned undergraduate and postgraduate degrees in Economics from Moscow State University in Russia, MBA from the University of Wisconsin in the United States and a PhD in Management from the University of Northampton, UK. Previously he has held teaching positions at Moscow State University (Russia), Viterbo University (USA), Wayne State University (USA) and KIMEP University (Kazakhstan). He has been studying public-private partnership (PPP) management in Kazakhstan and Russia for over seven years and has published extensively in this area. Dr Mouraviev's research interests include PPP policy and governance in transitional nations, disaster risk management, stakeholder value management in corporate governance, and the interplay between how companies practice corporate social responsibility (CSR), the government perspective on CSR and citizens' perceptions.

The role of public-private partnerships in capacity building for disaster risk reduction in coastal communities

The paper aims is to investigate the role that public-private partnerships (PPPs) may play in capacity building for disaster risk reduction in coastal areas and explore the dynamics contributing to this role. The paper draws on the interplay of three approaches – value for money, transaction cost economics and stakeholder theory – and builds a conceptual model that explains and critically assesses the reasons that underpin PPP deployment in the contextual environment of Russia. Although, in the Russian context, partnerships cannot secure value for money due to high costs and extensive government support, PPPs bring social value as partnerships deliver services that the government or other business and organisational arrangements are unable to provide. A significant dimension of the PPPs' social value refers to disaster risk reduction in the field of utilities and housing infrastructure. Additionally, in coastal communities PPPs may successfully engage in construction and operation of bridges, tunnels, sea ports and other infrastructure facilities that may increase resilience of coastal areas to disasters. Whilst coastal communities are exposed to high risk of natural disasters, private firms may be reluctant to invest in infrastructure without government financial support. PPPs that often require government guarantees, payments and subsidies, may effectively handle environmental risks and deliver an uninterruptible supply of public services that comply with the necessary quality standards, an overarching objective of disaster risk reduction in the infrastructure sector. As governments in many nations including Russia have not yet identified any other feasible solution for upgrading and maintaining the infrastructure and other facilities in coastal areas, PPPs should play a significant role in capacity building for disaster risk reduction in infrastructure, by reconstructing and protecting these assets. Hence, by tackling the threats posed by coastal hazards PPPs deliver social value that outweighs monetary costs.

Keywords: Public-private partnership (PPP), disaster risk management, coastal communities, social value, infrastructure

Hilda Mufiaty



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Hilda Mufiaty became a lecturer at Architecture Department Engineering Faculty, Syiah Kuala University, right after she finished her Bachelor degree in Architecture from Universitas Sumatera Utara (USU), Medan, Indonesia in 1998. She did her Master degree in Built Environment (Sustainable Development) at The University of New South Wales (UNSW), Sydney, Australia in 2005. She teaches Architecture Design Method, Sustainable Architecture, History and Theory of Architecture and supervises student's work at Architecture Design Studios. Her research interests are sustainable architecture, green building design and planning, and disaster responsive design and planning. She is also member of the Australia Awards Alumni Reference Group (ARG) in Indonesia. She also has been working as an architect, planner and team leader for several projects. Her works as a practitioner ranging from planning, designing, monitoring and managing projects and programs particularly architectural, spatial planning and construction related projects.

Performance Evaluation of Post Tsunami Housing in Banda Aceh

Post disaster rehabilitation work has to be carried out in the shortest possible time frame, when the needs and expectations of affected community are usually not taken care. The need for immediate settlements has led to practical solution of mass-constructed houses which are designed, planned, constructed and managed based on standards and specifications established by governments, professionals and experts. E.O. Ibem et al. (2013) urged that some studies have shown that these standards and specifications do not suitable to the changing needs and expectations of users. Consequently, users are not always satisfied with the performance of their buildings. As a result some problems then occur such as building related illness and sick building syndrome, remodelling or modifications even abandonment of completed buildings. Preliminary observations show that almost all of the post tsunami houses in Banda Aceh have been modified and remodelled either right after early occupancy or later. The worst case is the houses are abandoned or demolished by the owner. Users admit that they dissatisfy with their houses. It raises questions what might become the reasons of the problems and why buildings perform poorly in meeting users' needs and expectations. E.O. Ibem et al. (2013) believe that the main reason is the lack of adequate knowledge of users' changing needs and preferences by architects and other professionals who design, construct and maintain buildings. This is as a result of inadequate research on this issue. There has been very limited examination performed in order to improve the work of professionals in the building industry. It is more particularly rare in the case of post disaster housing and buildings. Without evaluation and examination from the existing cases in disaster affected areas such as Banda Aceh, improvement and adjustment of post disaster housing and settlement that might will be needed in other disaster affected areas elsewhere are not possible to be carried out. The same failure and disappointment of the users will highly likely occur. This research will evaluate the performance of post-tsunami housing in Banda Aceh from the end-user's perspective after 10 years occupancy. It will investigate the performance of different components of the houses against users' needs, expectations and aspirations. It will attempt to examine the extent of post-tsunami humanitarian housings are effective and efficient in meeting the needs and expectations of users as a function of Building Performance Evaluation (BPE) measure. Evaluation on Aceh's case would become a lesson learnt and contribution in improving other post disaster recovery efforts elsewhere in the world particularly, in humanitarian post disaster housing aspects.

Keywords: Performance Evaluation; post tsunami houses; post disaster housing; Aceh.

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Dedi Mulyadi holds a Bachelor of Education from STTMI geological engineering, Bandung and a Master in Geological Engineering from ITB. A career as a researcher since 1991 Research Centre for Geotechnology - Institute Indonesia of Science, as a young researcher in the field of geology and geophysics, and as a lecturer in the Department of Geological Engineering in STTMI, Bandung, Indonesia.

At this time the focus of research in the field of spatial -based disaster. In the last few years the focus of research included the preparation of a web site for landslide disaster system

Classification of Landslide Vulnerability of South Sumedang Area using Storie Method

South Sumedang area often experiences landslides, which claimed many physical and economical losses. The detailed knowledge of landslide susceptibility based on its physical properties is required to aid the mitigation measures in this area. This study aims to classify the levels of susceptibility of landslides in South Sumedang using Storie method. Physical parameters such as land use, slope, geology, and precipitation data were used as the input to calculate the Storie Index. The results show that the South Sumedang area has five landslide susceptibility levels: very low, low, medium, high and very high. Most previous landslide locations are within the medium to very high susceptibility zone such as in South Sumedang district, Rancakalong, Situraja and Darmaraja. The landslides took place at bare land with little vegetation, slightly steep to steep slopes and composing rocks of the products of the young volcanic with medium precipitation/moist

Keywords: landslide, South Sumedang, susceptibility, Storie method

Dr Farah Mulyasari

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Dr. Farah Mulyasari is currently a researcher at the Research Center for Disaster Mitigation, a lecturer as well as a team member of CCS Gundih Pilot Project at Institut Teknologi Bandung – Indonesia. Since 2005 she has been actively engaged as a local expert in disaster management. She has been involved in community-based disaster risk management projects working with communities, local governments and non-governmental organizations as part of a collaboration between university-based research center, national agency, and international donors. She worked previously as project manager of Community-based Disaster Risk Management for Indonesia-German Technical Cooperation on Mitigation of Geo-risks. She received her B.Sc in Geology from Padjadjaran University - Indonesia, M.Sc in Resources Engineering from Karlsruhe Institute of Technology - Germany and obtained a Ph.D in Disaster Management from Kyoto University – Japan. She has researched on effective risk communication in enhancing climate-related disaster for Bandung City, Indonesia. She wrote journal articles and book chapters on risk communication through community-based organizations, such as women groups, youth groups and local faith-based groups in communities in Indonesia.

Enhancing Climate-related Disaster Resilience through Effective Risk Communication in Bandung, Indonesia

Recent publications on climate change risk indices, such as the World Risk Index from Buendnis Entwicklung Hilft and UNU-EHS or the Global Climate Risk Index from Germanwatch, suggest that Indonesia is at the top end of the most vulnerable country to climate change and natural hazards. This condition will exacerbate Indonesian urban areas. The 2004 Indian Ocean Tsunami is the turning point for Indonesia in rearranging its institutional framework on disaster risk reduction and climate change adaptation, focusing on institutionalizing local initiatives. The study addresses the linkage of climate disaster resilience and risk communication approaches at the local level. The adoption of Climate Disaster Resilience Index at the micro-city level (sub-district level) of Bandung City, Indonesia, demonstrates an approach to disclose the resilience of physical, social, economic, institutional, and natural dimensions of different areas within the city. The focus on resilience aims to foster actions enhancing the capacity of the city to future climate-related disasters through adequate planning decisions. Enabling this, communication envisages as the last mile of this comprehensive climate-related disaster resilience assessment on how the risk and resilience information collected at and conveyed to the public. Community-Based Society Organizations of Bandung has the potential in conveying that information to wider communities, which would trigger them to take actions. A set of indicators in Social Institutional and Economic Resilience Activities approach is developed to characterize the delivering process of risk information by community organizations through their activities at sub-districts and wards. Results indicate that communities' organization activities in Bandung implement a certain degree of risk communication, which is embedded in their activities by involving the local government, agencies, private sector and media in the process. As the output, the study offers a model of comprehensive risk communication approach; integrating climate-related disaster assessment and risk communication processes driven by local novel initiatives in city.

Keywords: disaster risk reduction, climate change adaptation, resilience, risk communication, local initiatives

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Taufika is a lecturer at the Department of Civil Engineering, University of Andalas, Indonesia. He is the head of Construction Engineering and Management laboratory since 2014. He is actively involved as a researcher in the Research Centre for Disaster Management, Andalas University. He currently teaches disaster management, project risk management, and engineering economy in undergraduate and postgraduate programmes.

He received a Bachelor in Civil Engineering from Andalas University in 1997. In 2000, he finished his master degree in construction management at the University of Birmingham, UK, and completed his PhD in year 2013 from the Centre for Disaster Resilience, University of Salford, UK. His thesis discusses the project risk management model for community-based post-disaster housing reconstruction.

Taufika's research interest is focused upon disaster management, construction management, and community engagement in construction project. He has written a number of publications including a book chapter, journal articles, and international conference papers. Acknowledgements have been received as his paper is awarded as the best paper in two conferences.

Project Risk Management for Community-based Post-disaster Housing Reconstruction

Indonesia is a country that is highly susceptible to disasters, particularly earthquakes. In the last decade, Indonesia has been hit by three large earthquakes; Aceh in December 2004, Yogyakarta in May 2006, and West Sumatra in September 2009. More than 500,000 houses have been heavily damaged. The extensiveness of housing reconstruction is the most problematic issue in the housing reconstruction programme sector. Although a community-based post-disaster housing reconstruction project (CPHRP) has been implemented, nevertheless the outcome was overshadowed by delays in delivery, cost escalation, unexpected quality, and community dissatisfaction. The implementation of good practice in project risk management in the construction industry is expected to enhance the success of CPHRP. Accordingly, this study aims to develop a risk management model for community-based post-disaster housing reconstruction approach.

Multiple case studies are selected as research strategies for this research. This study implements the sequential mixed method application, starting with a semi-structured interview and followed by a questionnaire survey as the primary method. Content analysis was used to analyse qualitative data, whilst descriptive and inferential statistics were deployed to analyse quantitative data.

This study reveals the importance of the understanding of a community-based approach in post-disaster housing reconstruction. Four highly significant advantages of CPHRP have been discovered, the most significant advantage being that it 'creates a sense of ownership' to beneficiaries of the project. Furthermore, the risk assessment revealed some high-risk events during the pre-construction stage of CPHRP. The project objective most affected by them is project time completion. Moreover, this study found twelve critical success factors (CSFs) of CPHRP, with the highest of the CSFs being 'transparency and accountability'. With careful attention paid to the above findings, it is expected that the success of the implementation of CPHRP can be increased.

Keywords: Disaster, post-disaster reconstruction, community-based, risk management

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Education:
S1 – Civil Engineering – Engineering Faculty – University of Syiah Kuala (1989 – 2005)

S2 – Management - University of Syiah Kuala (1998 – 2000)

S3 – Construction Project Management – University of Utara Malaysia (2007 – 2013)

Teaching Course (S1 University of Muhammadiyah Aceh, 2000 - now):

Construction Management; Research Method; Statistic and Probability; Engineering Economic; Value Engineering; Maintenance and Operational Management.

Teaching Course (S2 University of Syiah Kuala, 2013 - now):

Infrastructure Project Management; Research Method and Statistic; Maintenance and Operational Management; Construction Business Management.

International Publications (2013 – 2015):
1. The Moderating Effect of Technology Utilization on Project Management Function and Project Performance - Malaysian Management Journal Universiti Utara Malaysia, Vol. 17. 2013 Edition.

2. The Goodness of Measure on Construction Project Success for Sustainable Development in Aceh - AISCE 2013 Aceh International Symposium on Civil Engineering Infrastructure Planning and Management for Sustainable Development.

3. Minimizing the Cost for Repairing Road with Pavement Recycling - The 1st International Joint Conference of Indonesia – Malaysia – Bangladesh – Ireland 2015.

4. Optimization and Effectiveness of Bridge Construction Development Based on Value Engineering – International Conference 2015 – University of Serambi Mekkah Aceh.

Sustainable Road Infrastructure Development Priority Post Tsunami in Simeulue District - Aceh

The Growth and development of the city or region implicated to the population needs improvement, in addition to the increasing number of the population also has a major contribution to the population needs improvement. By the increasing of population needs, it will also increase travel demands human and goods/equipment's movement activity improvements within an area or city. Road infrastructure is one of the strategic elements in supporting the development in addition in accelerating the activity; economic and facilitating inter regional of people mobilities. The improving of development activities require more adequate road networks. The ring roads in Simeulue District have the total length of 310 km spread in 5 (five) sub districts and divided into 7 (seven) road segments, they are (1) Sinabang - Nasreuhe, (2) Nasreuhe - Alafan, (3) Alafan - Seurafon, (4) Serafon - Lewak Hulu, (5) Lewak Hulu - Lhok Makmur - Sangiran, (6) Sinabang - Lugu Sibahak, (7) Lugu Sibahak - Sangiran. The road construction needs the appropriate decision making method in order to help the policy maker in determining the priority according to the needs and the benefits involving all stakeholders. Based on the research results using AHP Method, it is obtained the rank of the development priority of Simelue ring roads consecutively is (1) Lugu Sibahak - Sangiran, (2) Serafon - Lewak Hulu, (3) Lewak Hulu - Lhok Makmur - Sangiran, (4) Sinabang - Nasrehe, (5) Sinabang - Lugu Sibahak, (6) Alafan - Serafon, (7) Nasrehe – Alafan. The priority scale results can be compared that there are the differences of priority rank in Simeulues Ring Roads Development and Nasrehe Simeulue - Alafan and Lewak Hulu - Lhok Makmur – Sangiran Road segment become the main priority and the development will be implemented in 2015. AHP Method Analysis mentions that Nasrehe – Alafan road segment is in 7 rank and Lewak Hulu - Lhok Makmur – Sangiran is in 3 rank in the development.

Keywords: Development priority, road infrastructure, post tsunami, AHP Method

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Dr. Rilya Rumbayan specializes in Structural Engineering, with a focus on non-destructive evaluation for concrete structures. She studied in Department of Civil Engineering at The University of Tokyo, Japan for her Master degree and completed her Ph.D. in 2013 in Department of Civil Engineering at University of Missouri, USA with a dissertation entitled Modelling of Environmental effects on thermal detection of subsurface damage for concrete bridges. Her study was supported by Asian Development Bank- Japan Scholarship Program (ADB-JSP) for Master degree and Fulbright Scholarship funded by the US Department State for Ph.D. In 2004-2006, she was research assistant of Department of Civil Engineering, The University of Tokyo. In 2008-2013, she was research assistant of Department of Civil Engineering, University of Missouri. Since 2013 until now, she works as Researcher and Lecturer at Civil Engineering Department, Manado State Polytechnic, Indonesia. Since April 2015, she holds a position as Head of Diploma III Study Program of Civil Engineering Department at Manado State Polytechnic.

Diagnostic of Concrete Performance for Earthquake Resistance Structures using Infrared Thermography

Cracking, delamination and spalling caused by earthquake related can affect the structural integrity of concrete and lead to further deterioration and damage. This kind of damage affects concrete structure safety and serviceability. Detection of this type of damage in its initial stages is critical to identifying repair and maintenance needs in order to prevent earthquake-related destruction.

Non-destructive evaluation (NDE) techniques are increasingly being considered for subsurface void detection in concrete structure. NDE is defined as testing that causes no structurally significant damage to concrete. In this research, Infrared Thermography technique can be used to detect and characterize subsurface delamination based on variations in surface temperature that are caused by the disruption of the heat flow through the delaminated area.

Keywords: Earthquake resistance structures, Infrared Thermography, delamination/subsurface voids

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I am a Chartered Civil Engineer and currently working as Research Assistant in Liverpool John Moores University (LJMU). I obtained PhD in 2012 and my thesis was entitled as "Development of a Low Carbon Cement from waste fly ash (biomass)". On completion of his PhD Sadique took up an EPSRC Research Fellow position in Low Carbon Concrete Project at Coventry University in 2012. In 2013, I appointed as full time Research Associate in a collaborative project of school of Built Environment, LJMU in partnership with The National Joint Utilities Group (NJUG). This industry funded project is aimed to work for investigating the fundamental causes of utility air void contents and materials failures in bituminous layers, develop better methodologies, processes and materials to achieve complaint performance in reinstatement works. Also I am working as part-time Lecturer at Department pf Civil Engineering at LJMU. In 2009, Sadique obtained MSc in Road Management and Engineering with Distinction from University of Birmingham and BSc in Civil Engineering from Chittagong University of Engineering and Technology (CUET), Bangladesh in 1996. Prior to starting Postgraduate study, Sadique also worked as Sub-divisional engineer of Bangladesh Roads and Highways Department during 1999 to 2008.

A quick method restoring asphalt pavement using low carbon materials

Construction of asphalt pavement is a carbon intensive in terms of production and time intensive relating to installation. A quick installation process using low carbon construction materials compared to conventional asphalting has been proposed in this research. The proposed technology will be useful in restoring communication at project level after any natural disaster.

Keywords: Low carbon asphalt material, asset restoration, cold mix asphalt

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Wisnu Setiawan has been member of academic staff in the Department of Architecture, Muhammadiyah University of Surakarta, Indonesia since 2000. Along with that, he has been involved in some architecture, urban design, and urban planning projects in Indonesia. He recently finished PhD at the School Built Environment, the University of Salford – before he joined the Department of Architecture and Built Environment, the University of Nottingham as a Research Associate. His recent research gave him experience in using grounded theory style to explore the dynamic between the built environment and conflict prone environment. It has sharpened his interest on sustainable design and development particularly from social perspective, including environmental psychology, community development, urban heritage, and resilient urban environment. His recent research also shows him that urban planning practice in Indonesia challenges a number of issues from the document preparation to the implementation. In the events of both man-made and natural disaster, planning practice has not taken the issue in to real action.

Social sustainability starts from community: development response to communal conflict in Indonesia

The urban population is increasing worldwide. In some cases, this has made urban environment becomes more sensitive and prone to conflict. Such conflict even could turn into violent conflict which happens not only in more developed but also in less developed countries, including Indonesia particularly during the socio-political turmoil in the year of 2000s. The discussion on social conflict has been focusing on socio-political context. On the other hand, several researchers have attempted to discuss urban development and urban policy delivery in relationship with social diversity issues and the potential conflicts; however, such examples are far from developing country's context, including Indonesia. The research attempts to present reciprocal urban development and planning in response to the recent conflicts in Indonesia. Focusing on three case studies which involve in-depth interview with 38 respondents in total from various backgrounds, the research adapts Grounded Theory approach to analyse the interview. The findings discover that the emerging categories are moving from personal level to city level. The pattern indicates that communal conflicts at personal level could explode into larger city level. Urban planning strategy could help in mitigating the potential conflict particularly from community level. Community level development would mediate larger planning agenda to be able to improve the performance of personal level development.

Keywords: Social sustainability, community development

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Dr Surendran is 30 years experienced academic, Civil / Environmental Engineer, water risk and sustainable development scientist. He is a registered programme and project manager who has an established international record of leading, developing and delivering programmes and project within the time and cost. He secured and managed resources (£18m direct & £20m partnership funding) and 71 R&D projects in 8 years. He led, coordinated, developed and managed quality Research and Innovation funded by Sri Lanka, UK and Europe. He is a Senior Lecturer / Associate Professor in Civil & Environmental Engineering, leading water related subjects. He is an active member of the Faculty's Low Impact Building Research Centre and the Agro-water & Resilience Research Centre. His research includes Hydro-geo environmental (drought, flood & erosion) risks and resilience.

He developed risk assessment and option appraisal methods; broad scale system and behavioural models; foresight scenario analysis and decision support frameworks for strategic (investment, development, asset management) and incident management planning. He worked about 12 years for UK Environment Agency and Defra's Flood and Coastal Erosion R&D programme as a Science Manager for Modelling and Risk Theme. He also took roles as Principal Scientist, R&D Programme manager, Risk Analyst, Senior Water Resources Planner and a water demand management coordinator. He has published over 75 papers in peer reviewed international journals, refereed conferences and 20 research reports. He has supervised 5 PhD and many MSc research theses.

Response Exploration Simulator and Operation-guide to Lower the Vulnerability to Extreme Weather and Climate Risks (RESOLVER)

The overall goal of the RESOLVER project is to reduce the loss of human life, socio-economic and environmental damage from various extreme weather/climate related hydro-meteorological hazards (floods, storms, droughts and extreme temperature) and geo-physical hazards (landslide and erosion). RESOLVER aims to innovate, a computer based tool (Emergency Response Exploration Simulator – ERES), akin to a "flight simulator". This tool is to provide understanding, training and to enhance the emergency responses exploration capacity of the respondents and the risk receptors of extreme weather and climate events, to manage the crisis. ERES will assess, forecast, visualised and dynamically demonstrate the immediate net-consequences of hydro-meteorological-geophysical hazards to reduce the vulnerability of the receptors (people, assets, infrastructures and eco-system) RESOLVER is focusing on emergency management operations and covering the whole crisis management, linking awareness, early warning and preparedness to effective responses. The project will work closely within the risk receptor society and coordination with first responders to improve function, usage and impact of the ERES to help timely and improve coordinated responses. This project is working with multi and inter-disciplinary partners within 15 institutions from 5 European countries as well as US partners. The ERES will be built by improving, combining and clustering an array of existing and new technologies as well as integrating modelling processes and systems. It will base on the existing knowhow of disasters, drivers, risks, resilience and responses as well as the role of current technologies and requirements from various policies / regulations.

A tool that RESOLVER will develop will be utilised to improve preparedness and rapid-effective decision-making capabilities during hydro-geological and geo-physical crisis or near crisis/event. Demonstration, pilot testing, development and dissemination of operational guidance illustrating the function, usage and impact of the ERES as well as the data and model management within ERES, will be carried out. This will improve the exploitation of the tool and technologies developed with the RESOLVER Project.

Keywords: Disaster, Crisis management, Climate change, Emergency, Vulnerability, Resilience, Preparedness, Source-Pathway-Receptor-Consequence

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In 1991, Eva Maya Farida Tumury completed her degree in Forestry from the University of Pattimura, Ambon, Indonesia. She joined the local government as a civil servant at the Ambon city council in 2000. In 2011 she was promoted as the Head of Section for Prevention and Preparedness unit in the Regional Disaster Management Agency of Ambon city. In 2013, she was promoted as the Head of Prevention and Preparedness division in the Regional Disaster Management Agency of Ambon City

She had received a number of trainings and workshops in the environmental protection and disaster management subjects, including:

2005: Log Inspector Supervision of Indonesian Forest Workshop

2009: Forest planning Wasganis PHPL workshop

2013: Senior Disaster Management Training

Attended seminar:

2014: Disaster risk reduction seminar 10 Year Tsunami commemoration

2015: Regional Workshop on Training Modules for Tsunami Exercises Policy Support

Disaster Multi Risk Analysis of Ambon City

The city of Ambon is located in the Ambon Island. The small island lies in 3° - 4° South and 128° - 129° East, with an area of 359.49 km2. The topographical condition of the area is mainly hill and steep land (>20%). The population of Ambon city is 378.615. This makes Ambon city exposed to various level of risks in the seven types of natural disasters analysed, namely Earthquake, tsunami, flood, landslide, abrasion, drought, and volcanic eruption.

- The results of the disaster multi-risk analysis of Ambon city suggest:
- The earthquake risk analysis of Ambon city shows that it has a high risk of earthquake
- The coastal areas of Ambon city need are exposed to tsunami risk. This condition is affected by the fact that a large area of the coastline are located in the ocean line and gulf of Ambon. The urbanised part of the coastal areas also need further attention, due to the lack of coastal protection, whether in form of buildings or vegetation. The
- With regards to floods and landslide, Ambon city is also exposed to various level of risk. This is particularly due to the hilly and steep land surface of more than 20%, as well as due to the large rivers surrounding the Ambon city.

Keywords: disaster risk analysis, Ambon city, natural disaster, tsunami

In In Wahdiny

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In In Wahdiny is one of Researcher in Research Center for Disaster Mitigation (RCDM-ITB). Her interests are in Disaster Education, Disaster Policy, Risk Communication, Community Disaster Preparedness, Disaster Resilience, Community-Based Disaster Risk Management, and Tsunami Early Warning. She completed her master degree on Development Study in Bandung Institute of Technology (ITB) in 2008. She has been involving in many activities related to disaster mitigation research and activities conducted by RCDM-ITB with funding from local and international donor. She also involved as author in several guideline related to the disaster mitigation such as Guideline Tsunami Drill Implementation for The City and Regency (published by the Ministry of Research and Technology- KNRT 2008, ISBN 978-979-630-052-5, Guideline on Tsunami Simulation for Community Preparedness (BNPB, 2014) and disaster education material (manuals, poster, booklet and e-book). Currently she joined as logic model analyst in the research "Integrated Local Emergency Operation & Response Policy Improvement and capacity Building for Advance-Early Warning System in The face of Near-Field Tsunami Risk (PEER Science).

Analysis of Community Vulnerability toward Earthquake and Tsunami based on Physical and Social Economic Factors Affecting the Community in the Coastal Zone of West Sumatera (Case Study of Padang City and Pesisir Selatan Regency)

West Sumatra Province is identified as one of provinces, which has high risk and probability toward earthquake and tsunami. The province is located on the Mentawai Megathrust, a meeting of the Indo-Australian Plate and the Eurasian Plate. Padang City and Pesisir Selatan Regency are the impacted areas of Tsunami in Mentawai megathrust. The objective of the research is to analyse community vulnerability to the earthquake and tsunami based on the physical and social-economic factors. The analysis was performed at the household / family level by analysing physical factor (location and elevation of the house, distance to the nearby shelter, condition of roads) as well as social economic factors (age, gender, occupation, income, house conditions, education). The data were collected from Padang City and Pesisir Selatan Regency through a structured questionnaire survey and field observation. The descriptive analysis and statistical calculations are performed to analyse the data obtained. Output of the research will be useful in identifying community groups which more vulnerable and the outcome will be inputs in the formulation of risk reduction strategies toward earthquake and tsunami based on the local context.

Keywords: Earthquake and Tsunami, Community Vulnerability, Physical Factors, Social Economic Factors, Local Context

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Nurrohman Wijaya was born in Bandung City, Indonesia. Currently, he is a researcher in study programme of Urban and Regional Planning, School of Architecture, Planning and Policy Develpment at the Institute of Technology Bandung (ITB), Indonesia. He obtained his bachelor's degree in the field of City and Regional Planning from ITB in 2004 and completed his master's degree in the field of Urban Environmental Management from the Asian Institute of Technology (AIT), Thailand in 2010. He had worked as a research associate in AIT and an urban planner in various sub-national and government agencies. His research mainly focuses in the area of urban planning, infrastructure planning, urban environmental management, sustainable urban development, and climate change adaptation.

Urban coastal community actions in response to water insecurity under climate-related disaster: A case study of Semarang City, Indonesia

Urban coastal areas in developing countries including Indonesia are facing the challenge of increasing demand for urban services particularly in water sector. This challenge can be more significant under climate-related disasters, such as coastal flooding, sea level rise, seawater intrusion and drought. Population growth and phenomenon of climate change affect to high vulnerability and risk to water resource. This situation will affect significantly to the changing of economic, social and environmental aspects. This study explores the adaptation measures of urban coastal community in response to water insecurity under climate-related disaster in Tanjung Mas Village, where is located in the northern of Semarang City, Indonesia. The selected urban coastal community area has a characteristic with the vulnerable area imposed to climate-related disasters, inappropriate condition, and limitation access to water resource. This area has experienced with climate-related disasters such as coastal flooding and sea level rise. Interview, observation, and household survey are conducted. It can be found several adaptation actions have been adopted by community to respond the disaster risk induced by climate change, such as constructing simple embankments and water pumps to remove water from the tidal floods, constructing an integrated drainage system to minimize the impact, buying the drink water to water gallon sellers. This study provides influential evidences that community can adapt on the situation created by climate-related disasters to generate sustained social-ecological enhancement. However, the performance of their current adaptation actions is only able to cope with the impacts in the short term. It recommends that future interventions encourage local government to aware for climate-related disaster risk reduction and to enhance the community capacity to be able to manage the related current situation.

Keywords: Climate-related disaster; Semarang City; coastal community; water insecurity

Dr Yangang Xing

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Dr Yangang Xing completed his PhD in Dynamic whole system simulation for sustainability planning, and spends most of his time on research funded by the EPSRC focusing on methodological and technical innovations supporting building and urban sustainability. Apart from doing academic research, he has also worked in architectural and engineering consultancy firms specialized in economic viable low/zero carbon building design and urban planning. He is a Fellow of the Higher Education Academy (FHA) and a Member of the Chartered Institution of Building Services Engineers Association (MCIBSE).

Yangang is a Sêr Cymru Research Fellow investigating the interactions between plants and architecture (e.g. the nexus of green infrastructure and urban heat islands/air quality, energy crops, organic building materials, biomimicry and food) through development and innovative applications of building physics research tools and, in a broader context, systemic modelling and assessment of future post-carbon building environment. Yangang is devoted to identify and develop new research applications to uncap the full potentials of multidisciplinary collaboration to tackle the grand challenges facing society on the horizon

Developing an Integrated Plants and Architecture Sustainability Services (IPASS) framework for Coastal Urban Resilience Planning and Evaluation

In this research, based on bioclimatic design principles, through identification and analysis of what CRITICAL services plants and architecture can provide (such as flood and contamination control, sand stabilization, shelter, thermal comfort, heating, cooling, food, fuels and aesthetic values), the authors proposed an Integrated Plants and Architecture Systemic Services (IPASS) framework to assist the designing of a healthy, sustainable and resilient coastal regions. The IPASS framework can form a systemic base to evaluate vulnerability and adaptability of coastal regions.

Current research activities in plants science and sustainable built environment are fragmented. The Integrated Plants and Architecture Systemic Services (IPASS) is new research area and it may contribute a new development in the disaster resilience research and practices.

The Integrated Plants and Architectural Services System (IPASS) has been developed based on a critical review of literature and industrial practices. A set of key performance indicators and 3D planning toolkit is proposed. Regional planners can use the IPASS tool to qualitatively and visually explore the dynamic impacts of natural disasters and understand the vulnerability and adaptability of a selected segment of coastal region. It underlines the importance of bioclimatic designs strengthening the disaster resilience of coastal regions.

Further attributes of the IPASS framework, system structure of resilient coastal regions, and key indicator selection and classification scheme will be explored in this paper.

Keywords: Urban sustainability, plants and architecture, health and wellbeing, urban heat islands, green roofs and walls, urban green infrastructure

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I joined Jenderal Soedirman University as a lecturer in 1999, teaching development management. In 2004 I joined the women study centre as a public policy analyst staff and I started to interest in gender studies. During this time I have done several research and community service that related to the gender issues. I also had attended some workshops, conferences, and training in gender equality campaign across Indonesia. It gave me more knowledge and skills in understanding of gender issues.

I started my PhD in England by doing research about Gender Mainstreaming for Sustainable Post Disaster Reconstruction in Earthquake Regions in Indonesia. I gained a lot of experience and knowledge during my study by attending conferences, short course, and workshop. I joined Android School as well, both online and residential programme in 2013 and 2014. I already published some papers in several conference proceedings as well as a paper in UNISDR Annual Report.

Strategies for Mainstreaming Gender into Sustainable Post-Disaster Reconstruction: Experience from Bantul District Indonesia

The purpose of this study is to identify strategies and mechanisms to mainstreaming gender into post-earthquake reconstruction at Bantul district Yogyakarta Indonesia. Case study has been applied to provide thorough understanding of types of gender mainstreaming strategies and key factors that enable and hinder within implementation. A total 18 interviews were conducted. The respondents were from policymakers, implementers and beneficiaries who were involved in Bantul earthquake reconstruction. The finding reveals various types of gender mainstreaming strategies that have been introduced into each phase of post-earthquake reconstruction: planning, designing, construction, and maintenance. In order to achieve fully benefits for sustainable reconstruction, the policymakers should adopt comprehensive gender mainstreaming strategies into every phase of post-earthquake reconstruction. Among key enabling factors of mainstreaming gender are political commitment of government, availability of gender mainstreaming framework, women leadership and participation, support from multi-stakeholders, adequacy of gender expertise, and rich community social capital. However, main constraining factors include traditional bureaucracy culture and low capacity of bureaucrats. The findings highlight the value of mainstreaming gender for sustainability of reconstruction, but policymakers should aware of potential enabling and constraining factors in order to achieve effective implementation.

Keywords: mainstreaming gender strategies, sustainable post-disaster reconstruction, Indonesia